



Appendix 9: Monitoring Program Priorities for Southeast Coast Network Parks



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Overview & Methods

Identification and prioritization of specific monitoring questions is critical to the identification of Vital Signs. Because the Southeast Coast Network (SECN) is taking a resource-allocation approach to selecting vital signs (see Appendix 4), parks' individual priorities of monitoring questions comprise one of three primary data sets to be used in the analysis and selection of vital signs (Figure A9-1).

Monitoring questions included in the tables were compiled from the Phase I and Phase II reports from the first twelve Inventory and Monitoring Networks to receive funding where specific monitoring questions were clearly identified (Milstead and Stevens 2003, Emmott et al. 2003, Hubbard et al. 2003, Leibfreid 2003, Welch 2003, Weber 2003). Where appropriate, monitoring questions were also included from EPA's Draft Report on the Environment 2003 (United States Environmental Protection Agency 2003).

Questions are divided into three broad categories: Environmental Setting, Park Resources, and Agents of Change. Questions in the "Environmental Setting" category include resources that provide the primary drivers of ecosystem structure, function, and composition, though in most cases they are not actively managed by the parks due to the spatial and time scales involved (i.e., water, air, geologic, and weather resources). Park resources refer to those that are managed at one or more spatial and temporal scales ranging from individuals to ecosystems. Agents of change include both natural and anthropogenic drivers.

Monitoring questions were reviewed by all fifteen management units in the network and categorized into standardized priority rankings ranging (Table A9-1). In each case, the goal of the scoping meetings was to determine the degree of importance the *answer* to any given question from conservation and a park management / mission standpoints. Initial rankings were established during scoping meetings between Network and Park staff between February and July 2004 (Table A9-2). Additional questions were added to the list during scoping sessions with individual parks. Follow-up phone interviews were conducted with park staff during July 2004 to complete the data set. For each question the overall average score was calculated, as well as an adjusted average score based only on scores at which a monitoring question would be considered relevant (i.e., scores for marine or coastal issues were only averaged among coastal parks). Individual park scores, average scores, and adjusted average scores are presented in Table A9-3.

Monitoring questions and the Park priorities thereof are expected to be revised based on feedback received from conceptual modeling workshops, ongoing data mining, and refinement of decision-making models during the development of the Network's Phase I and Phase II reports. Furthermore, as parks continue with adaptive management of their natural resources, priorities might also change; reassessment of these priorities are likely to be a component of the Network's five-year programmatic review of the overall monitoring program.

Key Findings

Issues of highest importance to parks in the Southeast Coast Network fall into seven broad categories (Table A9-3). Notes as to the justifications for scores are included in Table A9-4.

1. Exotic Plant Management and Control. Monitoring questions related to exotic plant management were the only questions consistently of high priority across all parks within the network. Currently only parks within Florida are included in an operation exotic plant management program: Canaveral National Seashore (CANA), Timucuan Ecological & Historic Preserve (TIMU), Fort Caroline National Monument (FOCA), Castillo de San Marcos National Monument (CASA), and Fort Matanzas National Monument (FOMA). Beginning in FY 2005, the remaining parks within the network will be included in a three-year pilot program to identify and remove exotic plant species. Monitoring needs related to identification of sites of existing exotic plants and tracking the success of management actions will be

critical for the long-term success of this program.

2. Water Quality. In general, questions relating to water quality were high across all parks also, but the water bodies among the park vary substantially across the Network.
 - a. Estuarine / Lagoonal. Nine parks within the network contain significant estuarine or marine waters: Cape Hatteras National Seashore (CAHA), Cape Lookout National Seashore (CALO), Fort Sumter National Monument (FOSU), Fort Pulaski National Monument (FOPU), Fort Frederica National Monument (FOFR), Cumberland Island National Seashore (CUIS), TIMU, FOMA, and CANA. Mosquito Lagoon at CANA is another significant brackish water body. Water quality in these systems is almost entirely driven by upstream or up-shore factors outside National Park Service boundaries or jurisdiction, and water quality monitoring is in general conducted by the various coastal states. Currently University of North Carolina at Wilmington, The University of Georgia, and The University of Florida are investigating watershed / landscape level influences of estuarine water quality at CAHA, CALO, FOPU, CUIS, TIMU, and CANA.
 - b. Coastal. Six parks (CAHA, CALO, CUIS, TIMU, FOMA, and CANA) contain significant areas with access to marine / ocean waters. In all cases except CANA, NPS jurisdiction extends only to mean high tide; CANA's jurisdiction extends ½ mile east of the shore line. Threats to coastal water quality include non-point source chemical contaminants from up-shore as well as marine debris.
 - c. Riverine. Six parks within the network contain or are bordered by significant river systems ranging from upland to coastal plain drainages: Chattahoochee River National Recreation Area (CHAT), Kennesaw Mountain National Military Park (KEMO), Horseshoe Bend National Military Park (HOBE), Ocmulgee National Monument (OCMU), Congaree National Park (CONG), and Moores Creek National Battlefield (MOCR). With the exception of the rivers contained within CONG, all other parks contain limited portions of the watersheds that the rivers drain. Adjacent land use and upstream development pressures are consistent threats to water quality among the river parks, but the types of land use and development pressures range widely from agriculture / animal husbandry operations, to extremely dense urban and suburban landscapes.
3. Geology & Geomorphology
 - a. Coastal Geomorphology. All coastal parks are experiencing geomorphic changes either through accretion or erosion. Though these processes are natural in barrier island ecosystems, the current rates and locations of accretional and erosional zones are likely outside natural norms. Non-natural factors that are suspected to influence erosion and deposition rates include dredging operations, jetty and pier construction / placement, and hardening of shorelines.
 - b. Stream Bank Erosion. Stream bank erosion and stability is a major concern at CHAT, HOBE, KEMO, and OCMU where hydrologic modification resulting from upstream watershed development and hydropower facility management has resulted in altered riverine flow regimes.
4. Water Quantity. Water quantity issues in general are currently of concern, but will likely become larger during the next 10-20 years as water demands in the Southeast increase.
 - a. Surficial. River systems provide the majority of drinking water for the southeast. Major water supply reservoirs are located upstream of HOBE, CHAT, OCMU, and CONG, that serve the areas of Montgomery, AL, Atlanta, GA, Macon, GA, and Columbia SC respectively. The amount of fresh water that reaches estuarine systems is likely one of the major drivers that influences estuarine and salt marsh ecosystem health.
 - b. Groundwater. The Floridan aquifer is the main water supply source for agricultural and industrial

needs along the southeast coast. The degree to which withdrawals affect park resources is not known, but as demand increases, the potential for impacts on park ecosystems could increase.

- c. Effects of hydrologic modification. In addition to the average amount of water available within parks, the timing and distribution of flooding events is also changing due to upstream or watershed land use activities. In general flooding frequency of major floods has decreased during the last twenty years, and hydropower “peaking” operations have introduced a flow regime in riverine ecosystems that is outside expectations in natural systems. Multiple other water diversion structures occur in or near parks for agricultural, pest control, or transportation purposes.
5. Fire Management (effects, risks, and planning). Twelve of the network parks currently have or are in the process of developing fire management programs. The activities that will be conducted at each park will vary widely from suppression to routine prescribed burning. In all cases, climatic data relating to fire risk will be useful for fire management planning and risk assessment. Programs implementing prescribed burning would benefit from fire effects monitoring.
6. High Priority Ecosystems & Habitats. The Southeast Coast Network contains multiple habitat types. The following four systems / habitats had the most commonality among Network parks.
 - a. Rivers. In addition to the six parks that contain large rivers, CAHA and CUIS contain smaller freshwater systems.
 - b. Coastal Dunes. Coastal dunes are major habitat features at CAHA, CALO, CUIS, and CANA. Future land acquisitions at TIMU might result in the addition of dune habitats there as well. Coastal dunes are particularly important due to the fact that (a) they support a wide variety of sensitive or protected species, (b) they are fragile, (c) they are particularly threatened by visitor uses, and (d) they play a significant role in the overall stability of the island..
 - c. Wetlands. Wetlands within SECN parks vary widely from intermittent interdunal pools to riparian floodplains to vast salt marshes. These systems are particularly sensitive to changes in water quantity.
 - d. Intertidal zones. Intertidal zones provide critical foraging and nesting habitats for many sensitive and protected species such as shorebirds and sea turtles. These areas are threatened by visitor uses, and predation from both native and non-native species.
7. Threatened, Endangered, and other Species of Management Concern. More than twenty species were identified for potential monitoring across the Network, though with very few exceptions, those needs were only relevant at 1-2 parks due to limited species’ ranges. In general, species-specific monitoring questions had the largest difference between overall average scores and adjusted average scores. In nearly all cases, floral and faunal differences among parks were large enough that few species’ ranges span more than three parks. Exceptions include shorebirds, marine turtles, and multiple exotic plant and animal species. The following include species whose distribution occurs across six or more parks *or* whose impacts are large.
 - a. Feral Hogs. Eight parks in the network have current, historic, or potential infestations of feral hogs: CAHA, CANA, CASA, CONG, CUIS, FOFR, OCMU, TIMU. Active eradication programs are occurring at OCMU and CUIS.
 - b. Shorebirds. Plovers, oyster catchers, least terns, and wood storks are of large concern at all coastal beach parks. Active monitoring occurs at CANA, CUIS, CAHA, CASA, and CALO, those these efforts are not currently coordinated.
 - c. Marine turtles. Marine turtles are monitored and protected at seven Network parks (CAHA,

CALO, CANA, CASA, CUIS, FOPU, and FOSU). These monitoring programs are currently coordinated with other state and federal agencies though not with one another. In addition to turtle monitoring, other related monitoring needs include predator, beach habitat, and light pollution monitoring.

- d. Feral Horses. Feral horses are present at CUIS, CALO, and CAHA. In addition to the need to monitor aspects of horse populations (i.e., demography, disease incidence rates), the effects of the horses on other park resources.

Tables

Table A9-1. Criteria for prioritizing potential monitoring questions.

Rank	Park Question	Example
5	Mandated (for the Park). The park is <u>required</u> to know the answer to the monitoring question as per legal or contractual obligations.	<ul style="list-style-type: none"> Monitoring red cockaded woodpeckers. If breeding pairs are present on the park, required under the recovery plan to conduct 100% census of population on an annual basis
4	Mission Critical. The Park <u>should</u> know the answer to this question to effectively manage its resources. Effectively answering this question through a monitoring program will shed light on multiple resource issues.	<ul style="list-style-type: none"> Anything directly or explicitly mentioned in Park legislation or current / future management plans. Examples might include the size and impacts of horse populations at CUIS, water quality trends at CHAT, etc. Success of NR Management, such as fire effects monitoring.
3	Mission Support. Answering this question would help the Park to better manage its resources, <u>but is not necessary</u> . Effectively answering this question through a monitoring program will shed light on multiple resource issues.	<ul style="list-style-type: none"> Trends in external / adjacent land use Trends and impacts of Air Quality (for some parks) Habitat fragmentation
2	Answering this question is of interest to the Park, but is not necessary for natural resource management. Effectively answering this question through a monitoring program might or might not shed light on multiple resource issues.	<ul style="list-style-type: none"> Research Biological Inventories Protocol Development
1	Not the responsibility of the Park.	<ul style="list-style-type: none"> Marine Fisheries at CAHA (perhaps).
0	Not applicable to the Park.	<ul style="list-style-type: none"> Estuarine processes at HOBE

Table A9-2. Purpose and participants of scoping meetings for prioritization of potential monitoring questions to be answered in the Southeast Coast Network Vital Signs Monitoring program.

Meeting Date	Meeting Location / Parks Involved	Meeting Participants
06 February 2004	Timucuan Ecological & Historic Preserve Fort Caroline National Monument	Shauna Ray Allen, Resource Management Specialist
18 March 2004	Canaveral National Seashore	John Stiner, Chief of Resource Management
19 March 2004	Fort Matanzas National Monument Castillo de San Marcos National Monument	Gordon Wilson, Superintendent Dave Parker, Site Supervisor
09 April 2004	Horseshoe Bend National Military Park	Mark Lewis, Superintendent Roy Appugliese, Park Ranger (Protection)
04 May 2004	Chattahoochee River National Recreation Area	David Lairson, Biological Technician Nina Hemphill, Biologist Sara McCort, SCA Intern / SECN Data Technician Christina Wright, SECN Data Manager
07 May 2004	Congaree National Park	Martha Bogle, Superintendent Bill Hulslander, Integrated Resource Program Manager
21 May 2004	Ocmulgee National Monument	Jim David, Superintendent Guy Lachine, Chief Ranger
26 May 2004	Moore's Creek National Battlefield	Ann Childress, Superintendent Linda Brown, Park Ranger (Interpretation)
27 May 2004	Cape Lookout National Seashore	Michael Rikard, Chief of Resource Management
28 May 2004	Cape Hatteras National Seashore Wright Brothers National Memorial Fort Raleigh National Historic Site	Jim Ebert, Resource Management Specialist
09 June 2004	Fort Frederica National Monument	Denise Spear, Cultural Resource Specialist
09 June 2004	Cumberland Island National Seashore	John Fry, Chief of Resource Management
14 June 2004	Kennesaw Mountain National Military Park	Willie Johnson, Park Historian
16 June 2004	Fort Pulaski National Monument	John Breen, Superintendent Cliff Kevill, Park Ranger
17 June 2004	Fort Sumter National Monument Charles Pinckney National Historic Site	Sandy Pusey, Cultural Resource Program Manager

Table A9-3. Potential monitoring questions to be answered through monitoring in the Southeast Coast Network, and park priorities for answering those questions. Scores for each question range from 5 (most important) to 0 (least important). Definitions and examples of scoring criteria can be found in Table A9-4. Adjusted averages are based only on non-zero scores, and therefore represent average priority only for those parks where relevant. Questions highlighted in green indicate those where adjusted averages were greater than 3.

Category			Question	CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Environmental Setting	Water Resources	Freshwater Streams & Rivers	What are the status and trends of surficial water quantity?	3	0	0	0	4	4	3	0	0	0	4	3	2	2	0	1.67	3.13
			Does changing water quality impact natural and cultural resources and visitor use?	3	0	0	0	2	4	3	0	0	0	4	2	3	4	3	1.87	3.11
			Is water quantity changing in response to water withdrawal and impoundment?	3	0	0	0	4	4	2	0	0	0	4	0	2	2	0	1.40	3.00
			What are the status and trends of water quality (chemical, physical, biological)?	3	0	2	0	4	4	3	0	0	0	4	3	3	4	4	2.27	3.40
	Freshwater Ponds & Lakes	Does changing water quality impact natural and cultural resources and visitor use?	3	2	2	0	2	4	4	0	3	0	2	0	0	4	3	1.93	2.90	
		What are the status and trends of water quality (chemical, physical, biological)?	3	2	2	2	2	4	4	0	3	0	3	0	0	4	0	1.93	2.90	
		What are the status and trends of surficial water quantity (water levels)?	2	2	2	2	2	3	4	0	3	0	3	0	0	2	3	1.87	2.55	
		What are the effects of human-induced (visitors) disturbances on freshwater resources?	2	2	0	0	2	2	2	0	2	0	2	0	0	2	4	1.33	2.22	
		To what extent is air chemistry affecting freshwater resources, and how is that changing over time?	2	2	0	0	2	2	3	0	2	0	2	0	0	2	2	1.27	2.11	
	Marine	What are the distribution, frequency, type, and sources of marine debris?	2	3	2	2	0	0	3	0	3	0	0	0	0	0	2	1.13	2.43	
		Is water quality suitable to support swimming / public access?	3	2	4	1	0	0	3	3	0	0	0	0	0	0	3	1.27	2.71	

				CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Category			Question																	
Environmental Setting	Water Resources	Marine	Are levels of contaminants changing in coastal waters?	2	3	3	2	0	0	3	3	2	3	0	0	0	0	4	1.67	2.78
			Are marine water bodies at risk for harmful algal blooms?	3	2	1	1	0	0	3	2	1	2	0	0	0	0	0	1.00	1.88
		Estuarine / Tidal Marsh	Are frequency / duration of algal blooms changing over time?	2	2	2	2	0	0	3	2	4	0	0	0	0	0	0	1.13	2.43
			What are the status and trends of turbidity?	2	2	4	2	0	0	3	2	3	0	0	0	0	0	3	1.27	2.38
			Is water quality degradation causing water bodies to be at an increasing risk for eutrophication?	3	2	2	2	0	0	2	2	3	0	0	0	0	0	2	1.20	2.25
			What are the status and trends of nutrient levels?	2	3	4	2	0	0	3	3	3	0	0	0	0	0	4	1.53	2.88
	Groundwater	Are freshwater inputs changing over time?	2	2	2	2	0	0	2	2	3	0	0	0	0	0	4	1.27	2.38	
		Are estuarine water bodies at risk for harmful algal blooms (red tides)?	3	2	2	2	0	0	2	2	2	0	0	0	0	0	0	1.00	2.14	
		What are the status and trends of surficial water quantity entering the estuarine system?	2	3	2	2	0	0	3	2	3	0	0	0	0	0	4	1.40	2.63	
		Are concentrations of freshwater and saltwater changing at tidally influenced sites? i.e., is the gradient shifting over time?	2	2	2	2	0	0	3	2	3	0	0	0	0	0	3	1.27	2.38	
		Are levels of contaminants changing in coastal waters?	3	3	3	2	0	0	3	3	3	3	0	0	0	0	4	1.80	3.00	
		Are the discharge and chemical properties of existing wells changing?	2	2	1	1	2	4	3	3	4	2	3	0	2	0	3	2.13	2.46	

				CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Category			Question																	
Environmental Setting	Water Resources	Groundwater	Is groundwater quality changing over time?	3	2	3	2	2	4	3	2	4	2	3	2	2	2	3	2.60	2.60
			Is groundwater quantity changing over time?	3	2	2	2	2	4	3	3	4	2	2	3	2	2	3	2.60	2.60
			Are freshwater groundwater table levels changing?	3	2	2	2	2	4	3	2	4	2	2	2	2	2	3	2.47	2.47
			Are saltwater groundwater table levels changing (i.e., saltwater intrusion)?	2	2	2	2	0	0	3	2	4	2	0	0	2	0	3	1.60	2.40
			Are water storage levels in existing natural aquifers decreasing?	2	2	2	2	0	2	3	2	4	2	2	2	2	2	3	2.13	2.29
			Are changes in groundwater levels or quality affecting riparian / salt marsh habitat or wildlife?	2	2	2	2	2	4	3	2	3	2	3	2	2	2	2	2.33	2.33
	Air Resources	Ozone	Are ozone air quality standards being met?	2	2	3	3	4	3	3	2	2	2	2	3	2	3	3	2.60	2.60
			Are ozone concentrations increasing, decreasing, or remaining constant over time?	2	2	3	3	4	3	3	2	2	2	2	3	2	3	2	2.53	2.53
		Particulates	What are the status and trends of measurable airborne contaminants in lichens?	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	1.87	2.00
			What are the status and trends of visibility impairment as a result of air pollutants?	2	2	2	2	0	2	3	2	3	2	2	3	2	3	2	2.13	2.29
		Toxics	What are the status and trends in deposition of air pollutants in the park?	2	2	2	2	2	3	3	3	2	2	3	3	3	2	2	2.40	2.40
			What are the status and trends of Nitrogen and Sulfur deposition within the park?	2	2	3	3	2	3	3	3	2	2	2	3	3	2	2	2.47	2.47

Category			Question	CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Environmental Setting	Air Resources	Toxics	What effect is air quality having on park monuments, plaques, tablets, cannons, and other classified historic structures?	3	2	3	3	2	0	4	3	3	4	2	2	4	2	2	2.60	2.79
			Is there a measurable rate of change in air quality?	2	2	2	2	3	3	3	3	3	2	3	3	3	2	3	2.60	2.60
		Other	What are the status and trends of light pollution?	3	3	2	2	2	4	4	2	0	0	2	2	0	3	0	1.93	2.64
			Are there trends in UV radiation interception?	3	2	2	2	2	2	2	2	2	2	2	2	2	2	0	1.93	2.07
			What are the status and trends of the soundscape?	2	3	3	4	2	4	4	2	3	2	3	3	3	4	0	2.80	3.00
	Geologic Resources	Coastal Geology	What is the rate of shoreline erosion, and is it changing over time?	3	4	4	3	0	0	4	0	4	4	0	0	0	0	4	2.00	3.75
			What is the spatial and temporal variation of the frequencies and magnitudes of coastal change?	3	3	3	2	0	0	4	0	4	3	0	0	0	0	2	1.60	3.00
			What is the rate of change in longshore sediment transport / sand budgets over time?	3	2	3	2	0	0	3	0	3	3	0	0	0	0	3	1.47	2.75
		Geomorphology	Are changes in geomorphology affecting flow or sediment transport?	2	0	0	0	4	2	2	2	2	2	3	3	3	4	3	2.13	2.67
			What are the effects of geomorphic changes on riparian vegetation.	2	0	0	0	4	2	2	2	0	0	3	3	3	2	0	1.53	2.56
			What is the quality of bed sediments (chemical / biological) and is it changing over time? Includes soft muck in salt marshes, too.	2	2	2	3	2	3	4	3	3	2	2	2	2	4	3	2.60	2.60

				CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Category		Question																		
Environmental Setting	Geologic Resources	Geomorphology	Is stream channel shape and size changing?	2	0	0	0	4	3	2	3	0	0	3	3	4	3	3	2.00	3.00
			Is the stability of riverbanks changing?	0	0	0	0	4	2	4	3	4	0	3	3	4	3	2	2.13	3.20
			Are sediment erosion and deposition rates changing over time in estuaries and lagoonal systems?	2	2	2	2	0	0	2	2	2	2	0	0	0	0	4	1.33	2.22
			Are sediment erosion and deposition rates changing over time in freshwater and tidal stream channels and banks?	2	2	3	4	4	2	4	2	2	2	2	3	4	4	4	2.93	2.93
	Soils		How do the physical, chemical, and biological properties of soils vary spatially and temporally across varied landforms, parent materials, vegetative types, and watersheds? (This is the soils inventory)	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2.07	2.07
			What are the effects of human-induced disturbances and modifications on soils?	3	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2.13	2.13
			What are the effects of air quality on soil resources?	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2.07	2.07
			What are the status and trends of soil erosion?	3	2	0	0	3	2	4	2	2	2	2	2	2	2	2	2.00	2.31
			What are the status and trends of soil fertility?	3	2	2	2	2	2	3	2	2	2	3	2	2	2	0	2.07	2.21
			What are the concentrations of toxic substances present in soils?	3	2	2	2	2	3	4	2	2	3	2	2	2	2	2	2.33	2.33
			What are the impacts of earthquakes on park resources?	0	0	0	0	2	2	0	2	0	3	2	2	2	0	0	1.00	2.14
			What is the risk of earthquake occurrence?	0	0	0	0	2	2	0	2	0	4	2	2	2	0	0	1.07	2.29
	Structural Geology																			

Category			Question	CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Environmental Setting	Weather and Climate	General	What are the frequency and distribution of lightning strikes?	3	2	4	2	2	2	3	2	2	2	2	3	2	3	2	2.40	2.40
			What are the effects of global warming on park resources?	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.00	2.00
			What are the effects of sea level change on Park resources?	3	3	2	2	0	2	3	2	3	4	0	0	2	0	3	1.93	2.64
			What are the severity and frequency of droughts?	3	2	2	2	3	2	3	3	2	2	3	2	2	2	3	2.40	2.40
			What is the rate of sea level change?	3	3	3	2	0	0	3	2	3	4	0	0	0	0	2	1.67	2.78
			What is the temperature, and is it changing over time?	3	2	2	2	2	3	3	3	2	2	3	3	3	3	2	2.53	2.53
			What is the precipitation rate, and is it changing over time?	3	2	2	2	2	3	3	3	2	2	3	3	3	3	3	2.60	2.60
			What is the frequency of hurricanes, tropical storms, and other high-energy storm events, and is it changing over time?	3	3	3	2	2	2	2	2	2	4	2	2	2	2	1	2.27	2.27
Park Resources	Species of Concern	Species Groups	What are the status and trends of state and federally listed rare plants (not listed plants) and species of local concern?	3	4	3	2	3	4	2	2	2	2	2	2	4	3	3	2.73	2.73
			What are the status and trends of rare and listed bird species in the park?	4	4	3	4	2	4	4	2	2	2	2	4	3	3	3	3.07	3.07
			Are the abundance of rare bird species and their habitats changing?	4	3	3	4	2	4	4	2	2	2	2	4	3	3	4	3.07	3.07
			How do the distribution and abundance of rare plant species change over time?	3	3	2	2	3	4	3	2	2	2	3	2	4	3	2	2.67	2.67

				CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Category			Question																	
Park Resources	Species of Concern	Species	What are the status and trends of Bachman's Warbler populations and are they changing over time?	0	0	0	0	2	2	2	0	0	0	2	0	0	2	2	0.80	2.00
			What are the status and trends of Carolina bog mint?	0	0	0	0	0	3	0	0	0	0	0	0	4	0	0	0.47	3.50
			What are the status and trends of alligator populations?	2	2	3	0	0	2	3	2	3	2	0	0	0	2	3	1.60	2.40
			What are the status, trends, and distribution of Grass of Parnassus (spelling?) populations?	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0.13	2.00
			What are the status and trends of sensitive joint vetch?	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.13	2.00
			What are the status, trends, and distribution of Atlantic sturgeon?	2	0	2	0	0	3	1	2	3	2	0	0	2	2	2	1.36	2.10
			What are the status and trends of marine turtles?	4	5	5	4	0	0	5	0	3	2	0	0	0	0	0	1.87	4.00
			What are the status, trends, and distribution of Georgia aster populations?	0	0	0	0	4	0	0	0	0	0	0	2	0	0	0	0.40	3.00
			What are the status, trends and distribution of Diamondback Terrapin populations?	3	3	4	3	0	0	3	2	3	2	0	0	0	0	3	1.73	2.89
			What are the status, trends and distribution of Atlantic Salt marsh snake populations?	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0.40	3.00
			What are the status, trends and distribution of Sand Heather (Hudsonia tomentosa)?	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.13	2.00
			What are the status, trends and distribution of Red Cockaded Woodpecker populations?	0	0	2	0	0	2	2	2	2	0	2	2	0	3	0	0	1.00

Category			Question	CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Park Resources	Species of Concern	Species	What are the status, trends and distribution of Manatee populations?	2	0	4	2	0	0	1	2	3	2	0	0	0	0	4	1.30	2.50
			What are the status, trends and distribution of Atlantic / Southeastern Beach Mouse populations?	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0.53	4.00
			What are the status, trends and distribution of Florida Scrub Jay populations?	0	0	4	2	0	0	0	0	0	0	0	0	0	0	2	0.53	2.67
			What are the status, trends and distribution of Eastern Indigo Snake populations?	0	0	4	4	0	0	0	0	0	0	2	0	0	0	4	0.93	3.50
			What are the status, trends and distribution of Painted Bunting populations?	0	2	3	4	2	2	2	2	3	2	2	0	2	2	3	2.07	2.38
			What are the status, trends and distribution of Least Tern populations?	4	3	3	4	0	0	3	0	2	0	0	0	0	0	2	1.40	3.00
			What are the status, trends and distribution of Bald Eagle populations?	2	2	2	2	3	3	1	2	2	2	0	2	0	2	3	1.87	2.15
			What are the status, trends and distribution of Wood Stork populations?	0	0	3	3	0	3	3	2	2	0	0	0	0	2	4	1.47	2.75
			What are the status, trends and distribution of Gopher tortoise populations?	0	0	4	4	0	0	4	0	0	0	0	0	0	0	4	1.07	4.00
	Exotics Invasives Nuisance and Others	Plants	What are the effects of exotic plant species on cultural landscapes / resources?	3	2	2	2	3	2	2	2	3	3	4	2	4	4	4	2.80	2.80

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Category		Question																	
Park Resources	Exotics Invasives Nuisance and Others	Plants	What are the trends and impacts of exotic aquatic plants on native communities?	0	2	2	2	3	2	4	2	0	0	2	2	2	4	1.93	2.42
			What are the trends in the distribution and abundance of exotic plants?	3	3	4	4	4	4	3	3	2	3	4	4	4	3	3.47	3.47
	Vertebrates		How are native species' limits of geographical or ecological range changing (i.e., armadillo, red foxes, beaver...)?	4	3	2	2	2	3	2	3	2	3	2	2	2	2	2.40	2.40
			What are the status, and trends in populations of raccoons?	4	3	4	2	2	2	2	3	2	2	2	3	2	2	2.50	2.47
			How are population trends, habitat, and movement patterns of horses changing over time?	3	4	0	0	0	4	0	0	0	0	0	0	0	0	0.73	3.67
			Are the distribution and abundance of feral hogs changing over time?	2	0	4	2	0	4	4	2	0	0	0	0	4	4	1.73	3.25
			What are the effects of exotic (and other) animals on cultural landscapes / resources?	2	2	3	2	0	4	4	2	3	2	3	0	0	4	2.33	2.92
			What are the trends and impacts of exotic fishes on native fish communities?	2	2	2	2	3	2	2	2	2	2	2	2	2	3	2.13	2.13
			What are the trends in non-native bird populations over time?	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2.07	2.07
			Are the distribution and abundance of nonnative mammal populations changing (not just hogs)?	3	0	2	2	3	4	2	2	2	2	2	2	2	2	2.13	2.29
			Are the distribution and abundance of feral dogs changing over time?	2	0	2	2	2	0	2	0	0	2	2	0	2	2	1.33	2.00
			Are the distribution and abundance of feral cats changing over time?	4	3	3	3	2	2	2	2	2	2	2	2	2	2	2.33	2.33

Category			Question	CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Park Resources	Exotics Invasives Nuisance and Others	Vertebrates	What is the magnitude and extent of hog-induced habitat degradation?	2	0	4	2	0	4	2	0	0	0	0	0	0	4	3	1.40	3.00
			How are population trends, habitat, and movement patterns of deer changing over time?	2	0	2	2	2	2	3	3	3	2	3	3	2	3	0	2.13	2.46
		Invertebrates	Are populations of nuisance / pest insect species changing over time (i.e., mosquitoes, ticks, fire ants)?	4	0	2	2	2	3	3	3	3	3	3	3	2	4	2	2.60	2.79
			Are population trends or outbreaks of destructive insects changing over time (forest pests)?	2	3	2	2	3	3	2	3	3	2	3	4	2	2	2	2.53	2.53
			What are the status and trends of exotic mussels?	0	0	3	3	2	3	3	2	2	2	2	2	2	2	0	1.87	2.33
	Communities	Fish	What are the status and trends in native resident fish populations (as opposed to migratory or non-native fishes)?	2	3	4	2	3	3	2	2	2	2	2	2	2	2	3	2.40	2.40
			What are the status and trends in fish health?	2	3	3	2	2	2	3	2	2	2	2	2	2	2	4	2.33	2.33
			Are species composition and distribution of fish changing?	2	2	3	2	3	3	3	2	3	2	2	2	2	2	4	2.47	2.47
			What is the trend in seasonal habitat use by anadromous fish species?	2	3	2	2	2	2	2	2	2	2	0	0	2	2	2	1.80	2.08
		Invertebrates	Are the species composition and distribution of freshwater invertebrates changing?	2	2	2	2	3	3	3	0	2	2	2	2	2	2	2	2.13	2.29
			Is intertidal community composition changing over time (i.e., inverts, macroalgae, intertidal fish, hardshell clams...)?	2	2	3	2	0	0	3	2	3	2	0	0	0	0	4	1.53	2.56

			CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Category			Question																
Park Resources	Communities	Invertebrates	Are the species composition and distribution of marine invertebrates changing?	2	2	3	2	0	0	2	0	3	2	0	0	0	0	1.00	2.14
			Is there a shift in invertebrate species richness and abundance in intertidal and subtidal (nearshore) habitats?	2	2	3	2	0	0	3	2	2	2	0	0	0	4	1.47	2.44
			Is the assemblage of pollinators changing?	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2.07	2.07
			Is the species composition and distribution of terrestrial invertebrates changing?	3	2	2	2	2	3	2	2	2	2	2	2	2	3	2.20	2.20
			What are the present and historical assemblages of plankton in park lakes and estuaries, and are they changing over time?	2	2	2	2	2	2	0	2	0	2	0	0	2	2	1.47	2.00
	Plants		Are plant communities displaying symptoms of ozone injury?	2	2	2	2	3	2	2	2	2	2	3	2	3	2	2.20	2.20
			Is there a shift in sea grass abundance and distribution in intertidal and subtidal (nearshore) habitats?	2	3	4	0	0	0	0	0	2	0	0	0	0	0	0.73	2.75
			Is there a shift in the distribution or relative abundance of salt marsh grass species (<i>Juncus</i> and <i>Spartina</i> spp.)?	3	2	2	2	0	0	4	2	3	2	0	0	0	4	1.60	2.67
			Are the diversity and extent of shell midden plant communities changing over time?	2	2	4	0	0	2	0	0	0	0	0	0	0	3	0.87	2.60
			Are the diversity and extent of coastal dune communities changing over time?	4	2	3	3	0	0	4	0	0	0	0	0	0	2	1.20	3.00

				CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Category			Question																	
Park Resources	Communities	Plants	Are the distribution, structure and composition of inland/upland forests changing over time?	2	2	2	2	3	4	4	2	2	2	4	3	2	3	2	2.60	2.60
			Is the health of heritage / champion trees changing in the park?	0	0	0	0	0	3	2	0	0	0	2	0	0	0	0	0.47	2.33
			What is the composition, structure, distribution, and abundance of vegetation communities on a large scale, and how do these characteristics change over time?	2	2	2	2	3	4	4	2	2	2	4	2	2	2	4	2.60	2.60
			How is the pattern of mortality, disease, and insect pests (native and non-native) in forest communities changing over time?	2	2	2	2	3	3	3	3	2	2	4	4	2	2	2	2.53	2.53
			What is the trend in plant phenology over time?	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.00	2.00
			What are the effects of (over) browsing pressure on plant communities?	3	3	2	2	2	2	4	2	3	2	2	2	2	3	0	2.27	2.43
			What are the status and trends of fire-adapted communities as a result of fire suppression, reintroduction, or other alterations of natural fire regimes?	3	0	3	3	3	3	4	3	0	2	4	2	2	2	4	2.53	2.92
			To what extent is rooting pressure (from feral hogs) affecting plant communities?	3	0	4	2	0	4	3	0	0	0	0	0	0	2	4	1.47	3.14
			Are the diversity and extent of maritime forest communities changing over time?	3	3	2	2	0	0	4	2	2	2	0	0	0	0	3	1.53	2.56

			CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Category			Question																
Park Resources	Communities	Mammals	What is the status of small mammal diversity, abundance and distribution, and are they changing over time?	2	2	3	3	3	3	2	2	2	3	2	2	2	3	2.47	2.47
			What is the status of bat diversity, abundance and distribution, and are they changing over time?	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2.07	2.07
		Reptiles & Amphibians	Are the abundance and distribution of aquatic breeding amphibians changing?	2	2	2	2	2	3	2	2	2	3	2	2	2	3	2.20	2.20
			What are the status and trends in amphibian health?	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2.07	2.07
			What is the incidence rate of Gopher Tortoise upper respiratory disease?	0	0	4	4	0	3	0	0	0	2	0	0	2	3	1.20	3.00
			Are selected amphibians or reptiles reproducing successfully?	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.00	2.00
			What are the status of reptile and amphibian diversity, abundance and distribution, and are they changing over time?	2	3	3	3	3	4	2	2	2	3	2	2	2	4	2.67	2.67
		Birds	What are the trends of common bird populations over time?	2	2	2	2	3	4	2	2	2	2	3	2	2	2	2.27	2.27
			What are the status of breeding bird diversity, abundance and distribution, and are they changing over time?	4	3	3	3	4	4	2	3	2	2	3	2	2	3	2.87	2.87
			What are the status and trends of migratory birds (neotropical and shorebirds)?	4	3	3	3	2	4	4	2	2	2	3	2	2	4	2.80	2.80
			Are there changes in species composition of land bird communities?	2	2	2	2	3	3	2	2	2	3	3	2	2	4	2.40	2.40

Category			Question	CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Park Resources	Communities	Birds	Are changes in habitat quality and availability affecting breeding land birds / shore birds?	4	2	2	2	3	3	4	2	2	3	3	3	2	2	2	2.60	2.60
			What is the status of wading / shorebird diversity, abundance and distribution, and are they changing over time?	4	3	4	4	3	2	4	2	3	2	2	3	2	0	4	2.80	3.00
			Are populations of nesting diurnal raptors changing?	2	2	2	2	2	3	3	2	3	2	2	3	2	2	3	2.33	2.33
		Non-Vascular Plants & Fungi	Are abundance and diversity of fungi changing?	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2.07	2.07
			How are lichen and moss populations changing over time?	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2.07	2.07
	Habitats & Systems	Beaches & Dunes	What are the status and trends of the amount of large woody debris on beaches?	2	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0.40	2.00
			What are the status and trends of shells on beaches?	2	2	0	0	0	0	2	0	0	0	0	0	0	0	2	0.53	2.00
			What is the grainsize distribution, content, color, and mineral composition of sand on beaches, and is it changing over space and time?	4	2	2	2	0	0	3	0	0	0	0	0	0	0	0	0.87	2.60
			What are the status, trends, and quality of wrack on beaches?	4	2	2	2	0	0	3	0	0	0	0	0	0	0	0	0.87	2.60
		Wetlands	Are the frequency, duration, and spatial extent of seasonally intermittent pools changing over time?	3	2	0	0	2	2	4	0	0	0	2	0	2	3	0	1.33	2.50
			What are the structure, diversity, and extent of wetlands and riparian zones, and are they changing over time?	4	3	3	0	4	3	4	3	3	2	2	3	3	3	4	2.93	3.14

Category			Question	CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Park Resources	Habitats & Systems	Wetlands	How is the distribution of wetlands changing over time? (patchiness)	3	2	0	0	2	3	3	3	3	2	2	2	2	3	2	2.13	2.46
		Rivers, Streams & Lakes	What is the biological integrity of streams (inverts, fishes, and algae...)?	2	0	0	0	4	4	3	2	3	2	3	3	2	3	3	2.27	2.83
			What are the density and distribution of woody debris in streams, and how are they changing over time?	2	0	0	0	2	2	2	2	0	2	2	2	2	2	0	1.33	2.00
			Are there changes in parameters describing physical habitat-related characteristics of lakes and streams? Includes tidal streams.	2	0	0	0	4	2	2	2	2	2	2	2	2	2	3	1.80	2.25
			What are the status and trends of instream habitat conditions?	2	0	0	0	4	3	3	2	2	2	2	2	2	2	3	1.93	2.42
			What are the status and trends of shoreline habitat characteristics in the littoral zone and the terrestrial shoreline in lakes and ponds?	2	0	0	0	4	2	3	0	0	2	2	0	0	2	3	1.33	2.50
			To what extent is sedimentation affecting the status and trends of stream habitats?	2	0	0	0	4	3	4	2	2	2	2	3	2	3	4	2.20	2.75
		Estuaries	Are physical and chemical features of the intertidal environment changing?	3	2	2	2	0	0	3	0	3	2	0	0	0	0	3	1.33	2.50
			What are the status and trends of shoreline habitat characteristics in the littoral zone and the terrestrial shoreline in lagoonal / estuarine systems?	3	2	2	2	0	0	4	0	2	2	0	0	0	0	4	1.40	2.63
			Are the distribution and use of fish spawning & nursery habitats changing over time?	2	3	4	2	0	0	3	0	2	2	0	0	0	0	4	1.47	2.75

			CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average		
Category			Question																		
Park Resources	Habitats & Systems	Terrestrial Systems	Is forest structure changing over time?	2	2	2	2	2	4	4	2	2	2	4	3	2	3	4	2.67	2.67	
			Are coastal dune habitats suitable to support dependent animal communities?	4	2	4	4	0	0	4	0	0	0	0	0	0	0	0	0	1.20	3.60
		Marine Systems	Is distribution, relative abundance, or species composition changing in subtidal habitats?	3	2	2	0	0	0	3	0	0	0	2	0	0	0	0	1	0.87	2.17
			Does climate change affect the distribution and species composition of subtidal species?	3	2	2	0	0	0	2	0	0	0	2	0	0	0	0	1	0.80	2.00
			Is the distribution, relative abundance, or species composition changing in intertidal habitats?	4	3	4	3	0	0	4	0	0	0	2	0	0	0	0	4	1.60	3.43
		General	Are land use or land cover types within Park boundaries changing over time?	3	2	2	2	2	2	2	2	2	2	2	4	3	2	3	4	2.47	2.47
Agents of Change	Park Resource Management	Maintenance / Trail Management	Does mechanical removal of hazard trees negatively impact natural ecosystem processes?	3	0	2	2	2	2	3	0	2	2	3	2	3	3	3	2.07	2.38	
			Are park management actions affecting sensitive plant communities (trail clearing, vegetation trimming, boardwalk construction)?	3	2	2	2	2	2	2	2	0	2	2	2	2	3	2	2.00	2.14	
			Are “down and dead” clearing activities affecting populations of animals that depend on forest litter for habitat, and are they best designed to mimic natural population and distribution dynamics?	2	0	2	2	2	0	2	2	0	2	2	2	2	3	2	1.67	2.08	

				CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Category			Question																	
Agents of Change	Park Resource Management	Exotic Plant Management	To what extent are management activities effective in eliminating or slowing the invasion of exotic species?	3	3	4	4	4	3	4	3	3	3	4	4	4	4	3	3.53	3.53
			What are the effects of exotic plant species on Park resources?	3	2	3	3	3	4	2	2	3	3	4	3	4	4	2	3.00	3.00
		Cultural Resource Management	To what extent are plants affecting Cultural resources?	3	2	2	4	3	2	2	2	3	3	3	2	4	4	4	2.87	2.87
		Fire Management	To what extent are tree densities, understory composition, and fuel loads changing over time in areas of (historically) natural fire? i.e., what is the level of fuel loading...	3	2	3	2	4	4	4	3	2	0	4	4	4	3	2	2.93	3.14
			To what extent does prescribed burning (or lack thereof) affect status and trends of fire-dependent, sensitive, and non-native plant populations?	2	2	3	0	3	4	4	3	2	0	4	2	4	2	0	2.33	2.92
			Does mechanical fuel reduction appropriately mimic natural ecosystem processes?	2	2	3	0	2	2	2	3	2	0	4	2	2	2	4	2.13	2.46
		Restoration	What are the status and trends in distribution of native and restored longleaf / flatwoods pine forests?	0	0	0	0	0	3	0	0	0	0	4	2	4	0	4	1.13	3.40
			Are actions to remove water control / blockage structures having the desired effect on wetland hydroperiod and hydropattern? (or other wetlands restoration efforts)	2	0	3	0	4	2	2	0	0	0	0	0	4	0	0	1.13	2.83
		External Stressors (Anthropogenic)	Land Use & Development	What is the rate of change in adjacent land use?	3	2	2	2	3	3	2	2	2	2	2	3	3	3	3	2.47

			CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Category	Question																		
Agents of Change	External Stressors (Anthropogenic)	Land Use & Development	What is the relationship between non-point contaminants and land use? This is a true research question...	2	0	2	2	2	2	2	2	2	2	2	2	2	2	1.87	2.00
			To what extent is adjacent land use affecting sensitive species within the park?	4	2	3	3	2	4	2	3	2	2	2	2	3	3	2.67	2.67
			What is the pattern of land use types within the landscape that might have an impact on Park resources?	3	2	2	2	2	3	2	2	2	3	3	3	3	2	2.47	2.47
			What is the degree of habitat fragmentation within the landscape (of which the park is a part)? And how is it changing over time?	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2.20	2.20
			To what extent is air chemistry affecting water resources, and how is that changing over time?	2	2	2	2	3	2	2	2	2	2	2	2	2	0	1.93	2.07
			How do roads throughout and surrounding the Park affect water flow, run-off, flooding, surface waters, and plant and animal communities within the Park?	2	0	2	2	3	4	2	4	2	2	2	2	3	2	2.27	2.43
			What are the status and trends of road density within and surrounding the park?	2	0	2	2	2	2	2	4	2	2	3	2	4	3	2.33	2.50
			Is local air quality near road corridors, campgrounds or areas of high visitor use changing?	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.00	2.00

			CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average		
Category			Question																		
Agents of Change	External Stressors (Anthropogenic)	Land Use & Development	What are the status and trends in upslope conditions that affect hydrology and delivery of sediments, large woody debris, and contaminants to streams and estuaries?	2	2	2	2	3	3	2	2	2	2	2	3	3	4	4	2.53	2.53	
			What are the status and trends in contaminant emissions (air quality)?	2	2	2	2	2	3	3	3	3	2	3	3	2	2	2	2	2.40	2.40
			What are the effects of human-induced disturbances on freshwater resources?	2	3	0	0	3	3	2	2	2	2	4	3	3	2	0	2.07	2.58	
			What are the status and trends of culverts and other flow restrictions within and surrounding the park?	2	0	3	0	3	2	4	2	2	2	2	2	2	4	4	2.27	2.62	
			What is the direction and rate of change of land use within the watershed?	3	2	2	2	3	3	4	2	3	2	3	3	3	3	4	2.80	2.80	
	Adjacent NR management	Are Park populations of deer, turkeys, hogs, waterfowl, and feral dogs changing in response to changes in hunting regulations outside the park?	0	0	2	2	0	0	0	0	0	0	0	2	0	2	0	0	0.53	2.00	
		What are the incidence rates of wildlife disease to which humans are at risk?	3	2	2	2	2	2	3	2	3	2	3	2	2	2	2	3	2.33	2.33	
		What are the incidence rate, virulence, and impacts of wildlife diseases on animal populations? (on adjacent lands)?	3	2	2	2	2	2	3	2	3	2	3	2	2	2	2	2	2.27	2.27	
		To what extent are external hunting pressures affecting animal populations within Park boundaries?	2	2	2	2	0	3	0	2	2	2	0	3	2	2	0	2	1.60	2.18	

				CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Category			Question																	
Agents of Change	External Stressors (Anthropogenic)	Adjacent NR management	To what extent are off-shore and adjacent fishing pressures affecting Park populations?	2	2	3	3	0	0	3	0	3	2	0	0	2	2	3	1.67	2.50
		Other	To what extent do mosquito control structures and other flow restrictions affect water resources?	4	0	3	0	0	2	4	0	4	0	0	0	0	4	0	1.40	3.50
			What are the effects of beavers on natural hydrology?	0	0	0	0	3	2	0	0	0	0	3	3	4	3	0	1.20	3.00
			To what extent do docks, piers, bulkheads and other shoreline stabilization structures affect natural hydrology and adjacent communities?	4	3	2	2	4	2	2	2	4	2	0	0	2	0	4	2.20	2.75
			To what extent do regional / adjacent stormwater management activities affect Park resources?	2	2	2	2	4	3	2	2	2	2	2	2	3	4	3	2.47	2.47
			To what extent are jetties affecting sediment transport budgets?	4	2	2	0	0	0	4	0	3	3	0	0	0	0	3	1.47	3.14
			To what extent are large impoundments and water diversion structures affecting water resources within Park boundaries?	4	0	3	0	4	4	0	2	3	0	4	0	2	2	0	1.87	3.11
			To what extent are shoreline erosion control structures (revetments) affecting erosion rates?	4	0	3	0	2	2	0	3	4	3	0	0	3	0	4	1.87	3.11
	Ecosystem Function	Energy / Material Flow	Are rates of nutrient or carbon cycling in riverine ecosystems changing over time?	2	2	0	0	2	2	2	2	2	2	2	2	2	2	2	1.73	2.00
			Are detrital loads from riparian zones into riverine ecosystems changing over time?	2	2	0	0	2	2	2	2	2	2	2	2	2	2	2	1.73	2.00

			CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average	
Category		Question																		
Agents of Change	Ecosystem Function	Energy / Material Flow	Are chemical, physical, or biological processes in wetlands changing over time?	3	2	2	0	2	2	3	2	3	2	2	2	3	3	3	2.27	2.43
			What are the extent and impacts of bioaccumulation and biomagnification on park resources and visitor experience?	3	2	2	2	2	3	2	2	3	2	2	2	2	3	2	2.27	2.27
	Disturbance / Recovery	To what extent are flow dynamics and hydroperiod of aquatic systems changing over time (including rivers, lakes and ponds, wetlands, and estuaries, ditches)?	2	2	2	2	4	4	3	2	2	2	2	2	3	3	4	2.60	2.60	
		To what extent are the magnitude, frequency, and extent of flooding events changing over time?	2	2	0	0	2	4	2	2	2	2	3	2	3	3	2	2.07	2.38	
		To what extent are the magnitude, frequency, and extent of high tide events (storm surges, seasonal changes) changing over time?	3	2	3	3	0	0	4	2	2	2	0	0	0	0	4	1.67	2.78	
		Are species associated with early successional stages of major (natural) disturbances adequately represented within the park?	2	2	0	0	2	3	3	2	2	2	3	2	2	2	3	2.00	2.31	
	Trophic Structures	What is the status and trends of large carnivores (bobcat or bigger)?	2	2	2	2	2	2	4	0	2	2	3	2	2	3	0	2.00	2.31	
		What are the status and trends of natural predators?	3	3	3	2	2	2	4	2	2	2	2	2	2	2	2	2.33	2.33	
		Are there changes in functional groups of terrestrial invertebrates and vertebrates over time?	2	2	2	2	2	2	3	2	2	2	2	2	2	3	4	2.27	2.27	
		What is the status and trends of large carnivore prey base?	3	2	2	2	2	2	2	2	2	2	3	2	2	2	0	2.00	2.14	

			CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average		
Category			Question																		
Agents of Change	Ecosystem Function	Animal Behavior	What are the status and trends of pollinators within the Park?	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.00	2.00		
	Other Issues	Visitor Use	To what extent are boating activities affecting submerged aquatic vegetation beds & associated communities?	2	3	4	0	0	0	0	0	0	0	0	0	0	0	2	0.73	2.75	
			To what extent are personal watercrafts, canoes, or other boats impacting natural resources?	2	3	4	0	2	0	4	2	2	2	2	0	2	0	2	1.80	2.45	
			To what extent are off-road vehicles impacting natural resources?	4	4	2	2	2	0	3	0	0	0	2	0	0	0	2	1.40	2.63	
			To what extent do human uses of natural areas affect behavior, distribution, and abundance of natural animal populations?	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2.53	2.53	
			To what extent do human-animal interactions affect behavior, distribution, and abundance of natural animal populations?	4	3	4	4	2	2	2	0	2	2	2	2	2	2	3	2.40	2.57	
			To what extent is use of backcountry / Wilderness areas affecting Park resources?	2	3	0	0	0	2	2	2	0	0	0	2	0	0	0	2	0.87	2.17
			Are the number and activities of concessionaires, Incidental Business Permit (IBP) users, and special use permits changing?	3	2	4	3	2	2	3	0	2	2	2	2	2	0	3	2.13	2.46	
			Are visitor uses impacting native vegetation?	3	2	4	4	2	3	2	2	2	2	2	3	2	2	2	2.47	2.47	
			To what extent are patterns of water-runoff, sedimentation, and erosion changing or increasing in areas of high recreation use?	3	2	3	3	3	2	2	0	0	0	2	3	2	0	4	1.93	2.64	

				CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Category			Question																	
Agents of Change	Other Issues	Visitor Use	What type and extent of natural resource degradation are occurring due to visitor uses?	4	4	4	4	3	2	4	2	2	2	2	3	2	2	4	2.93	2.93
			How are the type, amount, and distribution of visitor uses changing over time?	2	3	4	4	3	2	3	2	2	2	2	3	2	2	3	2.60	2.60
			How are the number, distribution, and size of human-impacted sites changing over time? (incl. trails, campsites, boat launches...)	3	3	4	4	3	2	3	0	2	2	2	4	2	0	4	2.53	2.92
			Are human uses within the park (Non NR management) affecting surficial hydrology?	2	0	2	2	0	0	2	0	2	0	2	0	2	0	3	1.13	2.13
			Are visitors' desires for, expectations of, and actual experiences in the park changing?	2	3	4	4	3	2	3	2	2	2	2	3	2	2	2	2.53	2.53
			To what extent is horseback riding on trails affecting natural resources	2	0	2	0	2	0	0	0	0	0	2	3	0	0	0	0.73	2.20
	Resource Extraction		What are the effects of commercial and recreational shellfish harvesting on park aquatic habitats?	2	3	4	2	0	0	3	3	3	0	0	0	0	0	4	1.60	3.00
			Are levels of native vegetation harvesting changing?	2	0	2	2	0	0	0	0	0	0	2	0	0	0	0	0.53	2.00
			Are commercially valuable plant species (i.e., ginseng, goldenseal, bloodroot) being impacted by illegal harvesting?	2	0	2	2	2	0	0	0	0	0	2	0	0	0	0	0.67	2.00
			What is the frequency and intensity of sand dredging?	4	2	2	2	3	0	2	0	0	2	0	0	0	0	2	1.27	2.38

			CAHA	CALO	CANA	CASA	CHAT	CONG	CUIS	FOFR	FOPU	FOSU	HOBE	KEMO	MOCR	OCMU	TIMU	Average	Adjusted Average
Category		Question																	
Agents of Change	Other Issues	Resource Extraction	How do beach re-nourishment projects affect hydrography (i.e., residence time, wave climate, loss of shoals, overland flow, sediment budget)?	4	2	2	2	0	0	4	0	0	2	0	0	0	2	1.20	2.57
			What are the effects of surface water extraction on Park resources?	2	0	0	0	4	3	0	0	0	2	0	0	2	2	1.00	2.50
			What are the impacts of specimen collecting on sensitive plant populations (scientific collection and poaching)?	2	2	2	2	2	0	2	2	2	2	2	2	2	3	1.93	2.07
			To what extent does hunting pressure within the park affect populations / communities (permitted and poaching)?	2	3	2	0	2	3	0	2	0	3	0	0	0	2	1.40	2.33
			What are the effects of channel dredging on natural systems?	3	3	2	2	3	4	0	4	3	2	0	0	0	4	2.13	2.91
			To what extent does groundwater extraction affect water tables, uplands, estuaries, wetlands, and surface water availability?	3	3	2	2	4	3	2	3	2	2	0	0	2	3	2.20	2.54
			To what extent do finfishing and shellfishing affect native populations (within park boundaries)?	2	3	4	2	0	3	3	3	2	2	0	2	2	4	2.27	2.62
			Is water quantity changing in response to (regional) water withdrawal and impoundment?	3	3	0	0	4	0	2	3	2	2	0	0	2	0	1.67	2.78
			Are dredging operations changing hydrology?	2	3	2	0	0	4	0	4	0	0	0	0	0	3	1.20	3.00
			What are the effects of sand mining on natural systems?	2	0	0	0	3	0	2	0	0	2	0	0	0	2	0.73	2.20

Table A9-4. Park Notes about score justifications from scoping meetings. Questions highlighted in green indicate those where adjusted averages were greater than 3.

Category			Question	Park	Notes
Environmental Setting	Water Resources	Freshwater Streams & Rivers	Does changing water quality impact natural and cultural resources and visitor use?	OCMU	yes. Not currently in any management plans (no GMP at this point). Should be included in future documents due to potential public health hazards.
				CHAT	water quality issues cause changes in visitor use patterns
				MOCR	upstream development pressure
				CAHA	certainly for visitor use
				CUIS	impacts of horses
				KEMO	visitor uses not in water here.
			Is water quantity changing in response to water withdrawal and impoundment?	CHAT	tri-state related. Also related to FERC issues with the Morgan Falls Dam hydropower facility.
				CAHA	Okracoke, the town, the wastewater treatment plant is on park property
				CONG	Lake Murray dam upstream on Saluda River. With boundary expansion Catawba-Wateree watershed now included.
				HOBE	gage in park (USGS).
				MOCR	USACE facility management upstream for flood control. Score might go up to 3 or 4 with FERC relicensing or if impacts found to be negative.
				OCMU	not high priority, but reservoirs are upstream. (Macon Water Authority)
			What are the status and trends of surficial water quantity?	CAHA	Couple of creeks (freshwater) on Okracoke. Some tidal creeks, too.
				OCMU	have an issue with water level;
				MOCR	Water quantity is heavily influenced by tides. Water level changes 2-3 feet per day with tides.
				KEMO	two creeks on site. Get out of their banks, but no extended flooding.
				HOBE	dam proposal upstream.
				CHAT	related to tri-state issues
			What are the status and trends of water quality (chemical, physical, biological)?	FOFR	brackish
				CHAT	sewage-related issues are a huge issue for the park

Category			Question	Park	Notes
Environmental Setting	Water Resources	Freshwater Streams & Rivers	What are the status and trends of water quality (chemical, physical, biological)?	MOCR	salinity important, particularly during storm events.
				OCMU	Same reason as above
				CUIS	horses have a potential impact
				KEMO	lots of development; chemical plant upstream. Other urban effects. Might need to be upgraded to 4.
		Freshwater Ponds & Lakes	Does changing water quality impact natural and cultural resources and visitor use?	OCMU	Upstream of turtle pond, a junkyard is potentially leaching heavy metals and other contaminants. Priority would change to "4" pending findings of contamination.
				CUIS	b/c most of freshwater is in a closed system
				KEMO	only beaver ponds are present.
				FOPU	gators use the ponds in the winter months. We are considering the moat around the fort as a part of the "ponds" section.
				CONG	Wise lake, Weston Lake, Bates Old River (massive oxbow in new section).
				CAHA	freshwater ponds are present perhaps as many as three
			To what extent is air chemistry affecting freshwater resources, and how is that changing over time?	CONG	we know that mercury is getting into the water and into the fish (atmospheric deposition). Methyl mercury contamination appears to be an issue. Right now being studied by SCDNR. Might change to a 3 or 4 based on results.
				FOPU	likely not an issue.
				CUIS	nearby paper mills could be a source of contaminants.
			What are the effects of human-induced (visitors) disturbances on freshwater resources?	OCMU	they're fishing. During floods, connected to the river so some debate as to whether or not that's an issue. Number of fishermen changes drastically over time.
				FOPU	have some issues with litter, and potentially wildlife.
				CONG	fishing impacts. Litter. Overuse of banks. Bates old river, once acquired, will have a ton of use. Right now overused and not public property.
				CUIS	not a big problem because of low visitation
			What are the status and trends of surficial water quantity (water levels)?	CUIS	many species dependent on habitat. Necessary for wood stork nesting / management
				CHAT	not considering bull sluice lake as part of the lake system (included with rivers)
				FOPU	if they go down, habitat gets lost for alligators and fish. Also won't be serving their purpose without water.

Category			Question	Park	Notes
Environmental Setting	Water Resources	Freshwater Ponds & Lakes	What are the status and trends of water quality (chemical, physical, biological)?	CHAT	two small isolated fish ponds that are not connected to the river system; water quality not thought to be a significant problem for management
				CONG	Lakes, ponds & rivers are all included in management plans in all-encompassing "water resources". When flooded, all the same.
				FOPU	have two ponds. Mosquito control ponds. One has saltwater intrusion. Changing water chemistry can affect species distribution both in the water and in riparian areas.
				HOBE	the "beaver pond" on site is about 10 acres.
				OCMU	Upstream of turtle pond, a junkyard is potentially leaching heavy metals and other contaminants. Priority would change to "4" pending findings of contamination.
				CALO	Need to pay attention to salinity; not sure the degree to which they're tidally influenced
			Are levels of contaminants changing in coastal waters?	FOSU	have had oil spills in the past. River discharge comes from Charleston area.
				CALO	Park sits on science advisory panel for the Albemarle Pamlico Sound.
				CUIS	including both biological and chemical
				FOPU	particularly during high tide events.
				FOFR	marsh has sewage-related bacteria problems that have been found by GA DNR that have resulted in beach closings
				CASA	NER on the Intracoastal Waterway is doing some monitoring.
			Are marine water bodies at risk for harmful algal blooms?	CALO	Haven't had any that we know of yet, but <i>Pfiesteria</i> is a potential issue. Potentially after hurricanes?
				FOPU	GADNR is responsible for monitoring for coliform and oxygen etc. in coastal waters.
				CUIS	none have been recorded here.
				CAHA	includes <i>Pfiesteria</i>
	Marine		Is water quality suitable to support swimming / public access?	CALO	NC monitors on the sound side. The park "does not recommend" swimming
				CASA	Not sure who, if anyone, is doing this.
				FOFR	not happening (no public access)
				TIMU	Do have objectives in the WMP to maintain Class II waters (recreation)
				CUIS	state involved in EPA's BEACHES program. As a result, we know water quality is good
				FOSU	no swimming areas within the park.

Category			Question	Park	Notes
Environmental Setting	Water Resources	Marine	Is water quality suitable to support swimming / public access?	CANA	Needed for health reasons. Swimming is one of our greatest resource activities
				TIMU	An issue in the estuarine side, but not on beaches because not in jurisdiction.
			What are the distribution, frequency, type, and sources of marine debris?	CUIS	no marine debris monitoring happening at this time
				FOSU	~200 acres near Fort Sumter. Park doesn't have any beach property.
				FOPU	Savannah state did a study on marine debris for the county that occurred two sites on the park. Sources primarily from boating and shipping (offshore)
				CASA	military waste can be a problem sometimes.
				CANA	medical waste, hazardous materials, plastics. Detrimental to both humans and wildlife.
				CALO	Problem exists; marine debris surveys underway
				CANA	Potential impacts to swimmers
			Are levels of contaminants changing in coastal waters?		
		Estuarine / Tidal Marsh	Are concentrations of freshwater and saltwater changing at tidally influenced sites? i.e., is the gradient shifting over time?	CASA	no salinity gradient really present on site; system is primarily rainfall driven.
				CANA	dictates habitat suitability for all species.
			Are frequency / duration of algal blooms changing over time?	FOPU	have algal blooms in the moat. Potentially of concern in the marsh as well. When it happens it's a big issue that halts all other park ops.
				CAHA	no idea what goes on in tidal marshes
			What are the stats and trends of turbidity	CANA	affects seagrass-the basis of the Mosquito Lagoon ecosystem
			Are freshwater inputs changing over time?	FOPU	related to marsh grass die-off. Could become higher if die-off starts occurring on the park.
			Are levels of contaminants changing in coastal waters?	CALO	Park sits on science advisory panel for the Albemarle Pamlico Sound.
				FOFR	bacterial counts; possible public health concerns.
				FOPU	we're in pretty good shape here
				FOSU	CHPI has one historical tidal creek that is currently fed by runoff from nearby golf courses
			Is water quality degradation causing water bodies to be at an increasing risk for eutrophication?	CALO	no

Category			Question	Park	Notes
Environmental Setting	Water Resources	Estuarine / Tidal Marsh	Is water quality degradation causing water bodies to be at an increasing risk for eutrophication?	CUIS	lots of moving water
				TIMU	not really a problem because of diurnal flushing.
			What are the status and trends of nutrient levels?	CALO	state currently monitors shellfish. Waters have been closed due to contamination from septic systems
				FOFR	no upstream wastewater treatment plants. Perhaps nutrient loads are linked to bacterial levels, though.
				CUIS	hydrology possibly affected by dredging operations
			What are the status and trends of surficial water quantity entering the estuarine system?	CAHA	no issues that the Park is aware of
				FOFR	haven't noticed any problems
				TIMU	monitored by the city and part of the florida inland marine fisheries monitoring.
				CUIS	horses and consequent effects on erosion rates.
				CANA	Affects seagrass – the basis of the Mosquito Lagoon ecosystem
				CANA	Again, health effects for fishing, shellfishing, etc.
		Groundwater	Are levels of contaminants changing in coastal waters		
			Are changes in groundwater levels or quality affecting riparian / salt marsh habitat or wildlife?	CUIS	Only interested in the shallow aquifer; deep (Floridan) not an issue.
				HOBE	if they were, it would be high priority. This might become a two.
				FOPU	this is more driven by surficial aquifer and not at as much risk due to dredging operations.
				FOFR	don't see this yet.
				CHAT	we don't know if this is an issue, but it might be at the groundwater-river interface where the park's wetlands primarily exist.
				CAHA	don't know if there's an issue yet.
				CONG	Required to know as a part of the FERC relicensing process upstream.
				CHAT	no indication that this is a problem because the river's base flows haven't changed over time.
				MOCR	potentially raise to 3 if a reason is found to be concerned.

Category			Question	Park	Notes
Environmental Setting	Water Resources	Groundwater	Are saltwater groundwater table levels changing (i.e., saltwater intrusion)?	TIMU	WRD recommended starting a groundwater monitoring program b/c of external threats to water quality and quantity.
				MOCR	three wells on site, with pipes in them
				CASA	Saint Johns Water Management District has one test well on site.
				KEMO	no wells on site
				FOSU	irrigation well at Fort Moultrie. Not used for anything else right now. Don't know which aquifer it's tapped into.
				FOPU	have three existing wells. Five total on the island. All go down to the Upper Floridan aquifer. Scored a 4 with the proposed dredging work.
				FOFR	three artesian wells on site. Another well used for watering. None are used for drinking water.
				CHAT	only historic wells on site. Not currently being used.
				CONG	so closely tied to surface water system is very important.
				CANA	NASA responsible.
				CALO	no problems have yet been identified.
			Are water storage levels in existing natural aquifers decreasing?	CONG	don't know how integrated aquifer systems might be with surface water systems at park.
				FOSU	but if the wells run dry...
				FOFR	haven't noticed anything yet.
				CHAT	park is dependent on surface water for supplies; aquifers not an issue at this point.
				FOFR	raise to 3?
			Is groundwater quality changing over time?	CANA	groundwater not mentioned in WMRP; of growing concern, however as Indian Lagoon is largely groundwater fed. Recent research has shown groundwater influx to be considerable in Mosquito Lagoon.
				CHAT	we might reprioritize this with some additional research.
				CUIS	more interested in shallow than in deep groundwater
				TIMU	don't really know. USGS is doing GW monitoring as well as SJWMD.
				OCMU	Need to check the degree to which the pond or river are groundwater fed. Possibly some leaching issues from the upstream junkyard. Also affects from adjacent urban pesticide / herbicide treatments
				CAHA	although groundwater quality in shallow not good, most drinking water comes from deeper aquifer

Category			Question	Park	Notes
Environmental Setting	Water Resources	Groundwater	Is groundwater quantity changing over time?	CONG	USGS is currently monitoring this. 6 or 8 additional wells were put in to study the run of river effects to determine interplay between surface and groundwater. Don't yet know the specifics, but we know enough to make this a high priority.
				KEMO	a bunch of unmapped springs on the mountain. Discharge varies with precipitation.
	Air Resources	Ozone	Are ozone air quality standards being met?	TIMU	big concern because of the amount withdrawals regionally.
				FOPU	GADNR is doing ozone monitoring. Double check with ARD report.
				CHAT	the answer is no. Is being monitored.
				CONG	air quality has been monitored for more than 20 years by SCDHEC. Long-term data set makes this a very valuable question to continue tracking. Park is a class II park.
				KEMO	we know we're in an non-attainment area right now. Does this need to be a 4? Check on this.
				OCMU	Macon is a non-attainment area
				CUIS	Class II airshed.
		Particulates	Are ozone concentrations increasing, decreasing, or remaining constant over time?	CHAT	out of compliance. Getting data already from regional monitoring network. Ozone sensitive resources have been identified.
				KEMO	Atlanta is doing the monitoring for this.
				OCMU	monitoring station in Macon. Check for consistency with CHAT.
				FOFR	risk of ozone injury to plants is low (ARD)
				CONG	same as above.
				HOBE	need to check with Tonnie's report to see if this should be a three or four. Same with all air quality
				OCMU	One of the visitor experience things is to stand on the Great Temple Mound and enjoying the vista. Might need to be a 4.
				KEMO	Urban smog is limiting visibility. Increasingly, you can't see Atlanta or Marietta from the mountain. Huge negative impact to visitor experience.
				HOBE	because there's no altitude on site, haze-related issues.
				FOSU	no issues because of proximity to coast.
				FOFR	haven't noticed any.
				CHAT	no vistas available; maximum sight lines for natural areas is across the river.
				CONG	non-issue

Category			Question	Park	Notes
Environmental Setting	Air Resources	Toxics	What are the status and trends of visibility impairment as a result of air pollutants?	FOPU	Of concern. Industrial effluent upstream and west. When prevailing winds (typically easterlies) shift, this becomes a bigger problem. Also affects visitor experience.
			Is there a measurable rate of change in air quality?	CONG	yes...
				FOPU	also paper mills are nearby.
			What are the status and trends in deposition of air pollutants in the park?	CONG	because of mercury deposition, links to water quality issues.
				FOSU	don't have any problems right now, but if conditions change as Charleston grows, we might want to elevate scores. Primary sources of contaminants are from shipping industry and paper mills. Bigger boats expected in the future.
				FOFR	Herculean chemical plant in Brunswick; paper mill nearby or well. On rare occasion, a noticeable odor is observed in the park (once or twice per year). Effects on resources unknown.
				KEMO	not sure right now if there's anything we can do at this point.
				HOBE	see previous notes.
			What effect is air quality having on park monuments, plaques, tablets, cannons, and other classified historic structures?	CUIS	don't know susceptibility of tabby to toxics
				CHAT	don't know of any air-quality related effects on park CR
				CONG	no structures at risk.
				FOPU	doesn't seem like it's a problem at this point, but effluent from nearby industry present a potential risk.
				FOSU	doesn't seem like it's a problem at this point, but effluent from nearby industry present a potential risk.
				HOBE	park has three historic structures. Actually more than that. No AQ issues identified to date.
				KEMO	haven't noticed any environmentally-related degradation yet. Two main monuments are granite. One marble.
				MOCR	responsibility of park to keep monuments in good repair. Six total on site.
				CASA	Acid rain impacts are of concern to prevent dissolution of coquina structures (such as the fort at CASA).
				OCMU	no degradation yet observed. Potentially at historic structures...

Category			Question	Park	Notes
Environmental Setting	Air Resources	Other	Are there trends in UV radiation interception?	CAHA	because of visitor use health impacts. (public safety)
			What are the status and trends of light pollution?	MOCR	day use area only. No light-sensitive species on site.
				KEMO	has definitely increased over the last 30 years (anecdotal). Day use only park, though. Maybe a 0?
				HOBE	not a big issue at this point.
				FOSU	We don't own the beach, though it's a big problem for adjacent areas. Primarily day use areas; occasional night use at most.
				OCMU	will be putting lights on I-16 through the park. 35 foot high lights with "non-polluting" types of heads. Not sure what, if any, effects might be on wildlife, though. DOT will be doing this study.
				CONG	important due to wilderness designation.
				CANA	directional light sources b/c of interference with turtle disorientation during nesting and hatching
				CALO	not a big issue with turtles because of the lack of adjacent residential properties
				CUIS	sea turtles
				FOPU	day use only area. Astronomy clubs do use the park at night.
			What are the status and trends of the soundscape?	KEMO	in flight path for Lockheed Dobbins AFB in the Cheetham section of the park. Some railroads, too. Traffic noise typical of the metro area, but far enough away from interstate for that to be a problem.
				OCMU	getting louder, especially with I-16. Park has lost it's "sound of the swamp." Can be partially driven by losses in trees due to standing water & changes in hydrology. Major road widening of I-16 will allow for more traffic. Could provide info for the
				HOBE	because of park mission to preserve the sanctity of the battlefield, this is an important issue. Might be upgraded to 4 with a new management plan.
				FOSU	might increase as larger ships come in.
				FOPU	noise from HWY 80, overflights, shipping. Elevated to 3 because of the potential widening to HWY 80.
				CASA	interferes with the cultural mission of the park.
				CALO	increasing effects of military overflights and those of privately owned aircraft. Baseline information would be very helpful.
				CUIS	because of wilderness area and consequent need to maintain natural quiet.
				CONG	important due to wilderness designation.
				CANA	flyovers are a disturbance, but doesn't warrant a 4.

Category			Question	Park	Notes
Environmental Setting	Geologic Resources	Coastal Geology	What is the rate of change in long shore sediment transport / sand budgets over time?	FOSU	tied into the accretion issue.
				FOPU	we are having aggradation on the north shore of oyster shells (about a foot a week) and the source is unknown. Highly dynamic, but not sure if it's a problem.
			What is the rate of shoreline erosion, and is it changing over time?	FOPU	Active erosion happening along north shoreline. Potentially impacted by armoring and dredging operations. Also concerned about the lighthouse. If dredging happens, then new (bigger) ships will be coming through the shore.
				FOSU	Active erosion at Fort Sumter on (almost) all sides.
				CALO	Park is doing beach renourishment to protect the lighthouse and other structures on the sound side. Already, one historic structure has been lost (coal shed) in the last hurricane. Renourishment site will be 100' x 1,700'.
				CAHA	active erosion at / near FORA.
				CANA	erosion causes loss of T&E habitat for beach mouse, etc.
				CUIS	State of Florida wants to dredge portions of the south end of the Island to benefit lands to the south within Florida; Back barrier Erosion; Habitat for T&E species. Most beaches on CUIS are accretional.
			What is the spatial and temporal variation of the frequencies and magnitudes of coastal change?	CANA	same question as above?
				FOSU	Maybe a 4? Fort Sumter is actively accreting. Current management plans don't address this because it wasn't an issue at that time. Accretion has really become a noticeable structure in last 7-10 years.
	Geomorphology	Are changes in geomorphology affecting flow or sediment transport?		CANA	river question, so not applicable
				CHAT	same note as above
				FOSU	Perhaps with sediment sources upstream of the Charleston Harbor. Might be more driven by dredging, though.
				CAHA	perhaps would be important at streams at Okracoke
				OCMU	yes, it is, and it's a problem.
				FOPU	potentially an issue as geomorphic changes in Savannah River. Probably no changes in Oyster Creek.
				KEMO	some erosion happening on both Ward and Noses Creeks.

Category			Question	Park	Notes
Environmental Setting	Geologic Resources	Geomorphology	Are sediment erosion and deposition rates changing over time in estuaries and lagoonal systems?	MOCR	because of potential threats to bridge over Moores Creek.
				FOSU	ties into accretion area near Fort Sumter.
				FOPU	potential for sediment inputs from Wilmington Island area upstream in Oyster Creek drainage.
				CASA	Of interest to the Guanatanalano Matanzas estuarine reserve (NER), but not directly an issue for park resources.
				CALO	driven by hurricanes
			Are sediment erosion and deposition rates changing over time in freshwater and tidal stream channels and banks?	TIMU	thinking specifically in Fort George area. Both erosion and sedimentation where channel is being choked off. Also sediment losses in areas adjacent to the dredge areas. Fairly massive geomorphic changes as a result.
				CANA	Active erosion in lagoon due to boat wakes. Also concerns about Intracoastal Waterway dredging
				CHAT	tied into both tri-state water issues and hydropower facility management upstream. Water releases are causing erosion of riverbanks within the park boundaries.
				OCMU	stream that goes between the mounds is filling up very quickly; had to move footbridge due to sedimentation. During high rain events, roads have been close to being washed over. Will likely lose road at some points.
			Is stream channel shape and size changing?	CHAT	tied into both tri-state water issues and hydropower facility management upstream. Water releases are causing erosion of riverbanks within the park boundaries.
				CANA	river question
				MOCR	because of potential threats to bridge over Moores Creek.
				CONG	important piece of the puzzle to guide both research and management.
				FOFR	erosion concerns
				FOPU	not counting the Savannah because it's not within jurisdiction.
				KEMO	City of Marietta has proposed water management plans that would have altered stream channel geomorphology.
				OCMU	this could be a four because of road placement issues.
			Is the stability of riverbanks changing?	CONG	tied to hydropower generation in addition to natural processes.
				CANA	river question, so not applicable
				MOCR	because of potential threats to bridge over Moores Creek.

Category			Question	Park	Notes
Environmental Setting	Geologic Resources	Geomorphology	Is the stability of riverbanks changing?	HOBE	likely far less erosion than historically present due to hydropower generation facility upstream.
				OCMU	hydrologic modifications might be causing changes. There was a relatively large change in stream flow in 1994 following TS Alberto. Now a braided system
				FOFR	buckling of wood revetment; hardened shoreline near fort built in the 1950s. No signs of current erosion at the Fort site, though.
				CUIS	soundside erosion and effects on cultural resources
				FOPU	north shore.
				CHAT	tied into both tri-state water issues and hydropower facility management upstream. Water releases are causing erosion of riverbanks within the park boundaries.
			What are the effects of geomorphic changes on riparian vegetation.	KEMO	Vegetated to the stream banks just about everywhere. We are losing vegetation in some areas.
				FOPU	not applicable to tidal creeks...
				FOFR	no riparian vegetation.
				CHAT	WRD has identified this is a need related tristate issues.
			What is the quality of bed sediments (chemical / biological) and is it changing over time? Includes soft muck in salt marshes, too.	CANA	Haven't found either metals or DDT in sediment samples during dredging operations.
				CHAT	could lead to other questions or changes in priorities if effectively answered.
				CONG	another important piece of the puzzle... Important for water quality questions.
				FOPU	two year study was done.
				KEMO	we don't know if this is an issue or not.
				OCMU	because of both urban and junkyard-related contaminants.
				TIMU	have had some sediment contaminant work done. Found metals both inside and outside the park (known issue). People are doing restoration work in areas of contamination where it might be contaminated. Perhaps elevate to 4 as a result?
				CUIS	related to salt marsh and the large salt marsh shrimpery
				FOSU	At CHPI because of non-point sources of contaminants.
				FOFR	bacteria?

Category			Question	Park	Notes
Environmental Setting	Geologic Resources	Soils	How do the physical, chemical, and biological properties of soils vary spatially and temporally across varied landforms, parent materials, vegetative types, and watersheds? (This is the soils inventory)	CHAT	have all but Fulton County soils maps.
				CUIS	Have some potentially hazardous material sites from cattle dips
				FOSU	we do have some lead contaminated issues around the Coast Guard facilities (lead paint based). No abatement planned. Liberty square has an abated superfund site. Monitoring wells installed at Liberty Squire. Monitored as a part of the cleanup activitie
			What are the concentrations of toxic substances present in soils?	FOPU	potential contaminants from former Navy dump sites???
				CONG	mercury
				CAHA	two superfund sites. Also impacts from tires / oil, from ORVs.
				CANA	Will help complete the geologic map.
				CONG	related to mercury deposition. Wetlands like CONG are mercury sinks.
			What are the effects of air quality on soil resources?	CUIS	don't know if this is an issue at this point
			What are the effects of human-induced disturbances and modifications on soils?	OCMU	could be an interesting question here because it's been going on for more than 1000 years.
				KEMO	haven't been farmed in fifty years.
				CHAT	but interested...
				CAHA	orv impacts
				FOPU	two types of soils on site: marsh & man-made (dredge)
			What are the status and trends of soil erosion?	CHAT	this is a trail-management related issue.
				CAHA	orv impacts
				FOPU	don't know of any issues.
				FOSU	We have soil erosion on the forts, but it's more of a cultural issue.
				HOBE	High priority because adjacent logging activities have potentially increased erosive power of overland sheet flow on park resources.
				CUIS	dunes

Category			Question	Park	Notes
Environmental Setting	Geology	Soils	What are the status and trends of soil erosion?	CAHA	Dr. Parry showed that ORV affects breaks down grains of sand and impacts the ability to support natural vegetation.
				HOBE	legacy of cotton and forest agriculture have impacted soil fertility, and thus might impact the ability of managers to restore the forest back to natural conditions.
		Structural Geology	What are the impacts of earthquakes on park resources?	FOSU	1886 Charleston had largest earthquake on record east of the Mississippi.
				CHAT	Chattahoochee is on Brevard fault. Not very active if at all...
				CAHA	check for concurrence with CALO.
				CAHA	check for concurrence with CALO.
		Weather and Climate	What is the risk of earthquake occurrence?		
			What are the effects of global warming on park resources?	CALO	related to sea level change
			What are the effects of sea level change on Park resources?	FOSU	it is changing and we're worried about the Fort. In management documents frequently.
			What is the rate of sea level change?	CANA	affects dune and beach mouse habitat, stability of the island, etc.
			What are the frequency and distribution of lightning strikes?	FOFR	Pretty frequent; lose about one tree per year.
				CANA	already being done; weather people doing it at NASA. Need to know for determination of fire management strategies and prescriptions.
				CONG	could be important to help set proper burn frequency.
				FOSU	we have quite a few of them here...
				KEMO	we have some... last fatality here was a lightning strike on the trail. Look toward modeling lightning strike risk for visitors.
				OCMU	could be relevant to fire planning.
				CUIS	fire
				CHAT	could have some side benefits for tracking trends in arson frequency.
				CONG	certainly of concern. Useful data set because multiple components of ecosystem are affected.
				OCMU	have been in a prolonged drought except for 2003.
				MOCR	because of fire management / risk.
				KEMO	fire. Park mgmt is suppression and mechanical removal (no prescribed burning). Other than that, no observed long-term impacts of drought.
				FOFR	will be doing controlled burns once fire management plan is in place.

Category			Question	Park	Notes
Environmental Setting	Weather and Climate	General	What are the severity and frequency of droughts?	CHAT	Drives fire management at the Park. Also affects river flow, sewage overflows, forest health...
				CANA	important for fire management
			What is the frequency of hurricanes, tropical storms, and other high-energy storm events, and is it changing over time?	KEMO	have had some hurricane damage from Opal. One tornado in the last 30 years.
				CHAT	probable interaction with trees and forest management.
				CONG	CONG is in hurricane alley, so it gets hit by both hurricanes and tropical storms;
				FOSU	we have a hurricane plan. Potential to do the most damage to the park.
				HOBE	hurricane damage happens as far inland as HOBE.
				CANA	affects dune and beach mouse habitat, stability of the island, etc.
			What is the precipitation rate, and is it changing over time?	FOFR	related to fire management
				KEMO	fire management / fire risk
				MOCR	because of fire management
				CUIS	Getting climate network station; Fire management.
				CAHA	fire program at FORA.
				CHAT	affects river flow, sewage overflows, forest health...
				CONG	fire program related.
				FOFR	related to fire management
				CONG	fire program related
				FOPU	no prescribed burning; only suppression.
			What is the temperature, and is it changing over time?	KEMO	fire management.
				MOCR	because of fire management
				CUIS	Getting climate network station; Fire management.
				CAHA	fire program
				CHAT	management at the park is eliminating early-successional habitats on which several rare birds depend.
				CONG	park is a globally important bird area. And South Atlantic Coastal Plain Biosphere Reserve
				HOBE	no known rare bird species.
Park Resources	Species of Concern	Species Groups	Are the abundance of rare bird species and their habitats changing?	CHAT	management at the park is eliminating early-successional habitats on which several rare birds depend.
				CONG	park is a globally important bird area. And South Atlantic Coastal Plain Biosphere Reserve
				HOBE	no known rare bird species.

Category			Question	Park	Notes
Park Resources	Species of Concern	Species Groups	Are the abundance of rare bird species and their habitats changing?	KEMO	IBA designation
			How do the distribution and abundance of rare plant species change over time?	FOFR	revise if identified during inventories
				CUIS	habitats for many spp.
				CHAT	includes species like the pink lady-slipper that is of concern because of poaching.
				CALO	don't know what or if we have any.
			What are the status and trends of rare and listed bird species in the park?	FOFR	wood storks have been sighted. Only one or two species present (if at all)
				CHAT	don't know much about the bird community as a whole.
				FOPU	migratory. None nesting here.
				CAHA	got lots of them
				KEMO	IBA designation.
				CALO	piping plover monitoring important due to declining population
				OCMU	lots of migrants.
				MOCR	might need to be lower because none are present within the parks. RCWs, however are located within the County and habitat is being restored at the park.
			What are the status and trends of state and federally listed rare plants (not listed plants) and species of local concern?	FOFR	revise if some are identified during the inventory
				CHAT	several / many state-listed species for which monitoring would be beneficial.
				FOPU	none have been identified. Elevate if one or more is found.
				KEMO	not aware of any on site. Rescore to 3 if we find some.
				OCMU	don't know if any have been found yet. Are some plants. None present that we know of.
				CUIS	only one plant that is state listed
				CASA	no TER plants known on site.
		Species	What are the status and trends of alligator populations?	OCMU	evidence of them from SREL. Might increase if evidence of a larger population exists.

Category			Question	Park	Notes
Park Resources	Species of Concern	Species	What are the status and trends of alligator populations?	FOSU	at CHPI, we have one (Charlie).
				FOPU	reproducing on site.
				TIMU	have large ones with babies. Areas where located are not commonly visited, but they are located throughout the park.
			What are the status and trends of Bachman's Warbler populations and are they changing over time?	TIMU	Park does employee that does bird counts. Also Audubon does regular counts in the park.
				OCMU	don't know if it's here
				FOFR	don't think it should be there.
				KEMO	rescore if present.
				CASA	never heard of any mention of them.
				CHAT	not showing up on any species lists at this point.
				CONG	don't know if it's present.
			What are the status and trends of Carolina bog mint?	CONG	we know it's present on the park. Largest populations around!!
				MOCR	Research / Monitoring currently being conducted by TNC to assess fire tolerance, but not population health / status. The FMP EA states that MOCR contains the largest population in the world.
				OCMU	don't think it's here
			What are the status and trends of marine turtles?	FOSU	it could be in the harbor, but nothing resident.
				FOPU	don't nest on site.
				TIMU	State park does the monitoring because we don't have the nesting sites.
				CUIS	Part of the Index Network? (field data cards suggest "index" status)
				CALO	CALO is an index beach, and under agreement with USFWS has monitoring requirements as a result.
				CASA	we do have them nesting there.
			What are the status, trends and distribution of Atlantic / Southeastern Beach Mouse populations?	TIMU	we think we're outside the habitat / range.
				CUIS	not aware of any on site.

Category			Question	Park	Notes
Park Resources	Species of Concern	Species	What are the status, trends and distribution of Atlantic Salt marsh snake populations?	CANA	Entire range consists of two counties
				CASA	need to check with the reptile & amphibian inventory on whether this species is in range at FOMA/CASA. Might need to downgrade to 0.
				TIMU	FWS has it on the list, but our inventory says not.
			What are the status, trends and distribution of Bald Eagle populations?	CHAT	park is a major flyway corridor with potential nesting habitat. Eagles have been spotted for foraging infrequently.
				TIMU	nests present on the park.
				CASA	no nests on site, but present.
				CUIS	Some nesting on site. State monitors.
				OCMU	increase score if land expansion occurs.
				FOSU	it could be in the harbor, but nothing resident.
				CONG	don't know if we have any breeding pairs, though.
				CANA	nesting in the park (already monitored at CANA by FWS).
				CALO	no nests on site
			What are the status, trends and distribution of Diamondback Terrapin populations?	TIMU	not nesting on NPS land, but within the authorized boundary.
				FOSU	have been identified at the shoals at Fort Sumter, perhaps.
				CUIS	documented site.
				CANA	Population crashed at some point since 1979.
				FOPU	State species of concern.
			What are the status, trends and distribution of Eastern Indigo Snake populations?	KEMO	don't think we're in range for this one.
				TIMU	has been sighted. Commensal with the gopher tortoise.
			What are the status, trends and distribution of Florida Scrub Jay populations?	CASA	not sighted in years at CASA
				TIMU	Historically there, but the habitat is disappearing. Maybe score a 0. The scrub habitat present is marginal, and might improve with a fire program.

Category			Question	Park	Notes
Park Resources	Species of Concern	Species	What are the status, trends and distribution of Gopher tortoise populations?	HOBE	check with Whit's inventory to see if park is in range.
				KEMO	don't think we're in range for this one.
				CUIS	may be having a habitat loss problem; burrows vital to a number of other species.
			What are the status, trends and distribution of Least Tern populations?	TIMU	might be nesting in the mud flats
				FOSU	perhaps in range, but habitat not in park.
			What are the status, trends and distribution of Manatee populations?	CASA	in the river, but not within park boundaries.
				FOSU	it could be in the harbor, but nothing resident.
				CUIS	State monitors them
			What are the status, trends and distribution of Painted Bunting populations?	FOFR	haven't been spotted yet, but at CUIS
				CONG	need to check with species list.
				OCMU	strong active audubon group that could probably shed some light on that. If in NPSpecies, potentially a 3.
				FOPU	nest on site
				FOSU	Perhaps in range.
				CHAT	don't know if it's here.
				HOBE	don't know if the species is present, but might migrate through.
				CASA	state species of special concern (FL)
				CALO	check on distribution
				CANA	State species of special concern
			What are the status, trends and distribution of Red Cockaded Woodpecker populations?	CUIS	don't know if they're here
				CASA	only have a handful of pines.
				CONG	no active colonies, but might at some point because habitat is available.
				CANA	Not known within the Park, but is within range in Brevard County. Might need to elevate to 3 if habitat is deemed to be present.

Category			Question	Park	Notes
Park Resources	Species of Concern	Species	What are the status, trends and distribution of Red Cockaded Woodpecker populations?	FOSU	in the area, but we don't have any nesting in the park that we're aware of.
				MOCR	need to be aware of these if they settle. Habitat is present / being restored.
				TIMU	no habitat at the Park.
				FOFR	pileated woodpeckers, too.
			What are the status, trends and distribution of Sand Heather (<i>Hudsonia tomentosa</i>)?	CAHA	not sure of common name; located at WRBR.
			What are the status, trends and distribution of Wood Stork populations?	CASA	no nests on site; no habitat management planned.
				OCMU	no nests on site.
				CONG	on new property (dozens sited)
				FOFR	used to nest down the road. Have been sighted since. Don't have a rookery on site (or habitat for one??)
				CUIS	State does that
				CASA	Boundaries are the high tide line, so they shouldn't be an issue unless some nursery area is identified.
				CONG	has come up in proceedings with bridge reconstruction.
				FOPU	also potentially shortnose sturgeon.
				FOSU	it could be in the harbor, but nothing resident.
				MOCR	haven't seen any there. Think it's in range though. Might be too small of a system.
				OCMU	Historically present, but likely don't come up that far. No impoundments between the Park and the Atlantic, though.
			What are the status, trends, and distribution of Georgia aster populations?	CHAT	We think that the recovery plan says that if you have it you ought to be monitoring it. Candidate species. Extremely limited range
				HOBE	don't think in range.
				KEMO	It's at CHAT so it might be here.
			What are the status, trends, and distribution of Grass of Parnassus (spelling?) populations?	MOCR	people have been sighted collecting seeds without permits.

Category			Question	Park	Notes
Park Resources	Exotics Invasives Nuisance and Others	Plants	What are the effects of exotic plant species on cultural landscapes / resources?	CASA	could be a problem at Castillo
				CAHA	at FORA, Elizabethan Gardens is expanding into parks.
				CHAT	cultural landscape is exotic plants. No defined cultural landscape that is currently being managed for.
				FOPU	have changed cultural landscapes (tallow). Getting close to 4.
				FOSU	Wisteria at CHPI has been a problem, but a good portion has been removed.
				HOBE	privet etc., will have affect on the cultural landscape and could impact the ability of the park to meet its cultural mission.
				KEMO	we have kudzu, mimosa, privet, that mustard... not in cultural areas yet.
				MOCR	privet, Japanese honeysuckle...
				OCMU	problem on mounds with both plants and animals. Privet and tree of heaven both problems. Kudzu...
			What are the trends and impacts of exotic aquatic plants on native communities?	CHAT	we know that they're there - in the mainstem, isolated ponds, AND bull sluice lake.
				OCMU	don't know if there are any.
				CALO	don't know if this is a problem
				HOBE	milfoil is not in the area yet, but could become a huge issue if it found its way into the beaver pond.
				CUIS	do have alligator weed in freshwaters.
				CONG	Alligatorweed, water primrose, and Asian spiderwort on site.
				KEMO	we've got some areas that if we don't watch and nip it, we'll have a huge problem.
			What are the trends in the distribution and abundance of exotic plants?	FOFR	both privet and Chinese tallow are present.
				CHAT	Park has MANY exotic plants that need to be eradicated.
				CALO	<i>Phragmites</i> on site.
Vertebrates			Are the distribution and abundance of feral cats changing over time?	FOSU	some at CHPI.
				CAHA	affect piping plovers.
				CANA	could be a problem with southeastern beach mouse
				CASA	could be a problem with the Anastasia beach mouse.

Category			Question	Park	Notes
Park Resources	Exotics Invasives Nuisance and Others	Vertebrates	Are the distribution and abundance of feral cats changing over time?	CHAT	we know they're at CHAT, but we don't know what, if any, affect they're having on resources.
				FOPU	not a big problem with them right now; not a reproducing population.
				OCMU	feral cats present, but no identified issues.
				CUIS	none present that we're aware of at this point
			Are the distribution and abundance of feral dogs changing over time?	FOFR	have some
				HOBE	external hunting dogs, primarily
				KEMO	some loose neighborhood dogs, but that's all.
				CONG	do have free-ranging feral dogs in the park.
				MOCR	dogs "dumped" on site
			Are the distribution and abundance of feral hogs changing over time?	FOFR	historically had some. No current evidence of presence.
				KEMO	none spotted. Never been an issue here.
				CANA	Having a big impact
			Are the distribution and abundance of nonnative mammal populations changing (not just hogs)?	CANA	Basically hogs and cats; coyote should arrive soon.
				CAHA	including nutria
				KEMO	one list says we have feral cats, but none have been recently seen. Coyotes have probably taken care of that.
				FOSU	nothing other than cats present or noted to date.
				FOPU	also have black rats.
				FOFR	hogs and cats. Prior hog damage recorded, but none currently.
				CHAT	don't know what others might be there / be a problem.
				CASA	none present other than hogs and cats (addressed in other questions)
				MOCR	coyotes recently spotted across SR421
			How are native species' limits of geographical or ecological range changing (i.e., armadillo, red foxes, beaver...)?	KEMO	yes on the coyotes.
				FOPU	potentially coyote, too. Cattle egrets as well.
				CAHA	piping plover predation effects.
				CONG	beaver is important.

Category			Question	Park	Notes
Park Resources	Exotics Invasives Nuisance and Others	Vertebrates	How are native species' limits of geographical or ecological range changing (i.e., armadillo, red foxes, beaver...)?	OCMU	more coyotes present on the park.
				FOSU	only because of red fox.
			How are population trends, habitat, and movement patterns of deer changing over time?	FOPU	Park is currently monitoring.
				FOFR	if anything, going away on the island. Could increase as the island is developed. Hunting is happening nearby.
				FOSU	there are over at CHPI and at Fort Moultrie, but not an issue at this point.
				HOBE	probably have an overabundance of deer.
				KEMO	it is increasing. Haven't noticed any damage related to over browsing yet, though.
				OCMU	pretty sizable population and there might need to be some mgmt action in the future. Hunting along boundary.
				CUIS	maybe a 4
				CHAT	some areas have high densities of deer; park not doing any active management though. After research, this might need to be reassessed.
			How are population trends, habitat, and movement patterns of horses changing over time?	CALO	required by enabling legislation
				HOBE	armadillos are everywhere. Not sure the extent to which rooting is effecting, but they're everywhere.
				CALO	Nutria do some digging.
			What are the effects of exotic (and other) animals on cultural landscapes / resources?	KEMO	no species present that are doing this damage.
				FOSU	pigeons nest in Case Mates at FOSU.
				FOPU	Exotic bird and rat issues. If Armadillo get established, perhaps elevate to 4.
				FOFR	not much rooting going on.
				CONG	hogs.
				CUIS	hog rooting; horses (trampling, rubbing against structures)
				OCMU	Hogs
				CANA	rooting of archeological sites

Category			Question	Park	Notes
Park Resources	Exotics Invasives Nuisance and Others	Vertebrates	What are the status, and trends in populations of raccoons?	CALO	pipin plover predation
				CAHA	pipin plover predation effects
				CANA	sea turtle and diamondback terrapin predation.
				CASA	don't seem to have any impacts other than getting into garbage. No known impacts on turtles.
				FOFR	they rule the area
				FOPU	have an issue with raccoons; also monitored during the deer counts. Have had rabies documented. Probably controls population, though.
				TIMU	they're always around because it's an urban park.
				CUIS	current management would not change.
				HOBE	got them, but not a big deal for us.
				KEMO	they're here, but not causing any problems.
				MOCR	higher because of human interactions in public areas.
				OCMU	as far as we know we don't have very many. Never seen one in the daylight, and rarely at night.
			What are the trends and impacts of exotic fishes on native fish communities?	CHAT	recurrent issue, and some particularly nasty species (i.e., rice eels).
				OCMU	unknown
				FOPU	don't know of any exotic fish here.
				KEMO	don't know if we have any or what their impacts are. Cyprinella lutrensis (red shiner) is probably present, though.
			What are the trends in non-native bird populations over time?	CONG	Emus!
				KEMO	brown-headed cowbirds, European starling both recorded. Rare and or incidental, though.
				FOSU	within the park we don't have an issue.
				CHAT	don't know if starlings are a problem here.
				FOPU	becoming an issue. Lots of rock doves and starlings. Use cultural resources (cannons) as nest sites. Pigeons in the fort, too.
				CUIS	not an issue at this point

Category			Question	Park	Notes
Park Resources	Exotics Invasives Nuisance and Others	Vertebrates	What is the magnitude and extent of hog-induced habitat degradation?	CUIS	wouldn't change management
				HOBE	as far as known, not present at HOBE
				OCMU	play bloody hell with CR.
				CHAT	no hogs on site.
				CANA	again, hog impacts are a big problem; especially on wetlands and dependent amphibians. Some of these areas and associated species are rare in the park
		Invertebrates	Are population trends or outbreaks of destructive insects changing over time (forest pests)?	CALO	huge tick population at Shallowford Banks. WNV and Limes Disease are both of growing concern.
				FOPU	shipping channel is a source of invasives.
				HOBE	southern pine beetle.
				FOSU	park does monitor for gypsy moths.
				CANA	newly discovered moth that eats prickly pears might be a growing problem in the future. Also the bromeliad weevil
				KEMO	pine bark beetle is a problem. Getting hammered. Perhaps a 3?
				FOFR	have had outbreaks in the past
				CHAT	southern pine beetle. Because CHAT is such an isolated area, the impacts could be changing over time regardless of changes in frequency. Might need to reassess the ranking depending on when / if sudden oak death syndrome shows up.
			Are populations of nuisance / pest insect species changing over time (i.e., mosquitoes, ticks, fire ants)?	MOCR	of interest, but not relevant to NR.
				CANA	monitoring being done by East Volusia County mosquito control
				CHAT	southern pine beetle, potentially mosquitoes and WNV in the future. Gypsy moth has been monitored by USFS in the past.
				CONG	fire ants, ips, southern pine...
				FOFR	visitor effects
				FOPU	Mosquito control ponds on site. Also fire ants.
				FOSU	mosquitoes and fire ants are a big problem here. Have worked with the County for pest control.
				KEMO	got em all.
				OCMU	visitor, employee, and destruction to CR.

Category			Question	Park	Notes
Park Resources	Exotics Invasives Nuisance and Others	Invertebrates	Are populations of nuisance / pest insect species changing over time (i.e., mosquitoes, ticks, fire ants)?	TIMU	county monitors on site at FOCA for mosquitoes.
				CUIS	fire ants, definitely
				CAHA	West Nile Virus and lime disease
				HOBE	huge tick problem. Might get better with prescribed burning.
			What are the status & trends (presence / absence) of Australian Jellyfish	CANA	not yet present at CANA
			What are the status and trends of exotic mussels?	HOBE	I assume that corbicula is there, but at what cost to native resources.
				CUIS	green mussel has been found at the jetty
				CASA	green mussel is present
				FOFR	rescore to 0 if green mussels or Corbicula are not possible in system.
				FOSU	Green mussel? If not rescore to 0.
				MOCR	no documented Corbicula, but possible.
				CHAT	Corbicula corbicula within the river.
				FOPU	Green mussel is out there...
	Communities	Fish	Are species composition and distribution of fish changing?	FOFR	reassess after the fish inventory
				FOPU	don't know currently. Perhaps a good indicator for marsh health.
				CANA	outstanding fishery in Mosquito Lagoon
			What are the status and trends in fish health?	HOBE	no reported fish kills that we're aware of. If there's a significant change, we would be getting information from the State.2
				FOFR	reassess after the fish inventory
				CONG	could be of issue because of mercury.
				CANA	we need to protect outstanding fishery in Mosquito Lagoon
			What are the status and trends in native resident fish populations (as opposed to migratory or non-native fishes)?	MOCR	reassess all fish questions after inventory is complete.
				FOFR	reassess after the fish inventory
				CANA	we need to protect outstanding fishery in Mosquito Lagoon

Category			Question	Park	Notes
Park Resources	Communities	Fish	What is the trend in seasonal habitat use by anadromous fish species?	KEMO	extirpated.
				HOBE	no anadromous fishes make it up this far in the river system.
				MOCR	eels present.
				FOFR	reassess after the fish inventory
				OCMU	no dams between OCMU and the Atlantic.
				FOPU	most would be in the Savannah River
		Invertebrates	Are the species composition and distribution of freshwater invertebrates changing?	CASA	ditches with freshwater are the only freshwater resources on site. Don't know what resources, if any, are present. Might need to be downgraded to 0 with more information.
				CHAT	we know the invertebrate data will be and currently are useful for policy-related decisions.
				FOSU	at CHPI maybe, unless it's not really freshwater.
			Are the species composition and distribution of marine invertebrates changing?	FOPU	blue crabs and shrimp an issue.
				CANA	oysters, clams, crabs. Very important to commercial and recreational harvesters
			Is intertidal community composition changing over time (i.e., inverts, macroalgae, intertidal fish, hardshell clams...)?	CUIS	maybe a 4 because of marsh health concerns
				FOSU	New accretion area falls in this category. Don't know ecological importance yet for shorebirds.
				FOPU	includes all those in the marsh. Have had a clam seeding project.
			Is the assemblage of pollinators changing?	CHAT	no inventory done yet.
				HOBE	many of the local bee harvesters were affected by a bee fungus that might or might not have affected native species. could be bumped up if we find out thagt the bee fungus is affecting pollinator communities.
			Is the species composition and distribution of terrestrial invertebrates changing?	CAHA	ghost crab populations, if they grow too high, could be a problem.
			Is there a shift in invertebrate species richness and abundance in intertidal and subtidal (nearshore) habitats?	FOFR	Bloody Marsh

Category			Question	Park	Notes
Park Resources	Communities	Invertebrates	What are the present and historical assemblages of plankton in park lakes and estuaries, and are they changing over time?	CHAT	might be a 0
		Plants	Are plant communities displaying symptoms of ozone injury?	CUIS	check with ARD report
				HOBE	might need to be higher based on Tonnie's report.
				FOFR	not at high risk.
				CONG	would bump up to a four if there is evidence or reason to believe ozone injury is occurring due to mission of park.
				CHAT	don't know yet if this is an issue.
			Are the distribution, structure and composition of inland/upland forests changing over time?	FOSU	don't know if we can classify areas at CHPI as forest.
				HOBE	would be managing for both species composition and forest structure under FMP.
				CHAT	of issue because of forest pest outbreaks and fire management
				KEMO	we are losing pines because of pine beetle; community changes will likely occur as a result.
				CONG	feral hogs might be having an effect on this by reducing oak regeneration.
				CASA	most of forested areas are maritime. Might need to be up- or down-graded after a vegetation map is complete for the park.
				OCMU	loblolly pine is giving way to hardwoods and exotics.
				CANA	has impacts for T&E species
			Are the diversity and extent of coastal dune communities changing over time?	FOSU	we don't own that
				CUIS	stabilize dunes
				FOSU	we don't own the maritime forest community, but it's a part of the viewshed behind Battery Logan. Perhaps elevate score because viewshed is a cultural resource mentioned in GMP or CMP.
				CUIS	in enabling legislation
				FOPU	yes. It is evolving now, but historically wasn't there.
				FOFR	would be of interest; wouldn't change management
				CALO	on Shackleford Banks, a horse-related issue. Forest distribution potentially being driven by grazing patterns.
			Are the diversity and extent of maritime forest communities changing over time?		

Category			Question	Park	Notes
Park Resources	Communities	Plants	Are the diversity and extent of shell midden plant communities changing over time?	CUIS	Many shell middens on site.
				FOFR	no known shell middens on site
				HOBE	no shell middens on site.
			How is the pattern of mortality, disease, and insect pests (native and non-native) in forest communities changing over time?	CANA	Unique plant community (combination of temperate and subtropical species) on Turtle mound and several other middens. Of historical importance as well.
				KEMO	we know we have a huge problem with this and are losing forest trees.
				HOBE	same as above.
				FOPU	don't think impacts are that great at this point. Other question included public health concerns.
				FOFR	currently monitoring for gypsy moths.
				CHAT	forest is highly stressed; degree of vulnerability to stressors would be helpful to mgmt.
				FOSU	we do have some very old trees, though at CHPI.
				CUIS	have a state record live oak
				KEMO	had one; it fell down.
				HOBE	some very large trees on site, but none formally designated as heritage trees.
			Is there a shift in sea grass abundance and distribution in intertidal and subtidal (nearshore) habitats?	FOSU	don't know if we have any seagrass in the submerged area. If not, need to change to 0. Probably elevate score if we do have it.
				CANA	A lot of time and effort is spent by several agencies monitoring seagrass in Mosquito Lagoon. It is the basis of the lagoon ecosystem.
			Is there a shift in the distribution or relative abundance of salt marsh grass species (Juncus and Spartina spp.)?	FOFR	rescore to 3?; re: regional salt marsh die-off concerns
				FOSU	Salt marsh grasses over at CHPI.
				CUIS	salt marsh die-off an issue / concern

Category			Question	Park	Notes
Park Resources	Communities	Plants	To what extent is rooting pressure (from feral hogs) affecting plant communities?	CUIS	getting rid of hogs no matter what
				OCMU	focus is primarily on CR, but if there's plant impacts,
				FOFR	non at site now.
				CANA	having a dramatic effect on swales.
				CAHA	doing damage along the runway
			What are the effects of (over) browsing pressure on plant communities?	OCMU	not yet seen, but deer populations are growing. Could be an issue down the line that we need to keep on the radar screen.
				CUIS	horses and deer, particularly on salt marsh.
				KEMO	don't know of any right now. If deer populations grow, might need to elevate score.
				HOBE	probably don't have an issue at this point, but could get worse if deer populations continue to grow.
				FOPU	we have noted that there could be a problem.
				FOSU	don't have a browsing problem.
				FOFR	none right now.
			What are the status and trends of fire-adapted communities as a result of fire suppression, reintroduction, or other alterations of natural fire regimes?	CASA	some browsing pressure from deer is present.
				CALO	all plant communities on Shackleford
				CHAT	we know they're in decline. Many TER species are typical of fire-adapted ecosystems (Georgia aster, pink lady-slipper).
				FOPU	not a fire adapted community here.
				HOBE	goal of fire management plan is to bring back the longleaf pine community.
				KEMO	we don't know the answer to this yet. Don't know if we have fire adapted communities on site.
				OCMU	fire not to be reintroduced except to burn off the mound.
				CASA	this might change priority after the FMP is complete.

Category			Question	Park	Notes
Park Resources	Communities	Plants	What is the composition, structure, distribution, and abundance of vegetation communities on a large scale, and how do these characteristics change over time?	MOCR	not very large scale.
				CANA	How might a vegetation map change over time?
				CHAT	CHAT is a series of patches, some of which represent relict populations. How those change over time might provide critical data to future management decisions.
				HOBE	needs to be addressed to determine whether the park is meeting objectives outlined in the fire management plan and the mission goals.
		Mammals	What is the status of bat diversity, abundance and distribution, and are they changing over time?	CHAT	might change priority once more info is obtained from bat inventory. We know there has been a change over time.
				FOFR	reassess after mammal inventory if necessary
			What is the status of small mammal diversity, abundance and distribution, and are they changing over time?	FOFR	reassess after mammal inventory if necessary
				CHAT	small mammal communities tied to wetlands restoration and exotic plant management activities.
				CASA	beach mouse bumps this one up.
				CALO	does not include raccoons (too big)
		Reptiles and Amphibians	Are selected amphibians or reptiles reproducing successfully?	CHAT	likely some species are not successful due to the lack of finding during inventories. Not sure if this is a reproductive issue or a habitat issue...
			Are the abundance and distribution of aquatic breeding amphibians changing?	CHAT	currently unknown
			What are the status of reptile and amphibian diversity, abundance and distribution, and are they changing over time?	HOBE	could be heavily impacted by water quality degradation and loss of suitable riparian habitat. Might need to be adjusted to a 2.
				CALO	would be interesting to know. Don't know if communities are affected by the dynamic landscape at CALO. Might need to be rescored as a high 2.
				CHAT	Reptile and amphibian communities tied to wetlands restoration and exotic plant management activities.
				CUIS	Turtles

Category			Question	Park	Notes
Park Resources	Communities	Reptiles and Amphibians	What is the incidence rate of Gopher Tortoise upper respiratory disease?	CASA	important for the management of gopher tortoises on site.
				HOBE	don't even know if gopher tortoises are present.
				TIMU	don't think it's moved this far north. If detected in the County then elevate.
		Birds	Are changes in habitat quality and availability affecting breeding land birds / shore birds?	MOCR	some nesting species are present that visitors come explicitly to see (i.e., prothonotary warbler).
				HOBE	driven by FMP
				FOSU	Fort Sumter accretion area could be important bird habitat.
				FOPU	Not a lot of dynamics here in the park.
				CHAT	increasing. State is monitoring falcons.
			Are populations of nesting diurnal raptors changing?	CUIS	includes osprey
				FOSU	don't know if we have any.
				HOBE	driven by FMP
			Are there changes in species composition of landbird communities?	FOPU	we know there is, primarily in the realm of exotics.
				CONG	globally important bird area. Already monitored by SC DNR.
			What are the status and trends of migratory birds (neotropical and shorebirds)?	CANA	not much habitat. Wilsons plovers are nesting at Merritt Island NWR, though so they might be present at CANA.
				FOPU	with migratory birds, they're only here for a short period of time. Not much management to do.
				CAHA	plovers
				CAHA	plovers, oystercatchers
				CHAT	implies certain types of habitat (and quality)
			What are the status of breeding bird diversity, abundance and distribution, and are they changing over time?	CONG	globally important bird area.
				FOPU	painted buntings fall in this category.

Category			Question	Park	Notes
Park Resources	Communities	Birds	What are the status of breeding bird diversity, abundance and distribution, and are they changing over time?	FOSU	don't know what, if anything is nesting at the park. As nearby areas develop, park might become a refuge and score might need to be elevated.
				FOFR	not much active birdwatching at FOFR
			What are the trends of common bird populations over time?	KEMO	tied to visitor uses.
				FOSU	maybe if shoal at Fort Sumter sees increased usage.
			What is the status of wading / shorebird diversity, abundance and distribution, and are they changing over time?	CHAT	in decline and CHAT has some of the last remaining habitat in the area for these species.
				HOBE	none nesting, but we get them during the migration season. Probably herons and storks present too.
				FOFR	wood storks?
				CONG	will be gaining wading bird habitat with new lands.
				CAHA	plovers...
				MOCR	great blue herons.
				CASA	least terns and plovers are being monitored by the state with assistance from NPS staff. Screening off of nesting habitats is also done when found.
				CALO	have some nice lichen communities.
Habitats & Systems	Non-Vascular Plans & Fungi	Beaches & Dunes	How are lichen and moss populations changing over time?	CALO	have some, but not much
				CASA	would be mildly useful.
			What are the status and trends of the amount of large woody debris on beaches?	CUIS	habitat for shorebird nesting and foraging
				CAHA	Critical for shorebirds and dune habitats.
				CALO	don't really have big wrack lines down here. Only minimally have wrack, so maybe a 0.
				CALO	
				CALO	
				CALO	
			What is the grainsize distribution, content, color, and mineral composition of sand on beaches, and is it changing over space and time?	CAHA	Beach renourishment is likely to be happening in large amounts upstream, particularly in communities. Need background data before that happens.
				CAHA	

Category			Question	Park	Notes
Park Resources	Habitats & Systems	Beaches & Dunes	What is the grainsize distribution, content, color, and mineral composition of sand on beaches, and is it changing over space and time?	CALO	nothing abnormal going on currently, but possibly an issue with lighthouse area renourishment on the sound side.
				CANA	not an issue as long as no beach renourishment projects are happening.
				CASA	there is some up shore beach renourishment going on that can impact the beach. The source sand seems to be pretty similar, though. Perhaps a 3?
		Wetlands	How is the distribution of wetlands changing over time? (patchiness)	FOPU	are we losing wetlands due to filling in?
				CONG	all wetlands; talking about changes in types of wetlands which could impact other components of ecosystem.
			Is the frequency, duration, and spatial extent of seasonally intermittent pools changing over time?	CAHA	almost a 3.5
				HOBE	they do happen depending on the river level; might be important for herp reproduction.
				CHAT	some seasonally flooded impoundments within historic agricultural landscapes. Might provide habitat for wading birds and herps.
				CANA	primarily located in the swales between dune ridges. Provide habitat for many amphibian species not found elsewhere at CANA.
				CAHA	wetlands at Cape Point have been ditched, flood gated... No longer a natural habitat. Presenting the 3rd highest priority for mgmt.
				FOFR	includes salt marsh, Bloody marsh too.
				MOCR	in the process of doing wetland restoration
				KEMO	one intermittent wetland on the western boundary of the park. One more on the south end of the park
				HOBE	can be largely driven by beaver population.
				FOPU	could be an issue with saltmarsh die-off.
				CHAT	related to tristate issues.
				CASA	no freshwater wetlands on site.
				CALO	salt marsh loss over time
				CANA	Are efforts at saltmarsh restoration succeeding?

Category			Question	Park	Notes
Park Resources	Habitats & Systems	Rivers, Streams & Lakes	Are there changes in parameters describing physical habitat-related characteristics of lakes and streams? Includes tidal streams.	CHAT	again, tied to FERC and water allocation issues. Sedimentation effects are a major driver.
				HOBE	depends on the amount of logging in the area.
				CUIS	horse driven effects in tidal creeks.
				KEMO	3 due to the amount of development upstream that's contributing sediment.
				CHAT	this is the major issue facing the park.
				FOPU	potential upstream development related inputs.
			What are the density and distribution of woody debris in streams, and how are they changing over time?	FOSU	probably a low priority.
				MOCR	storms that cause lots of CWD cause stoppage of flows.
				CHAT	habitats highly degraded by discharge operation upstream. Tied to tri-state issues.
			What are the status and trends of shoreline habitat characteristics in the littoral zone and the terrestrial shoreline in lakes and ponds?	CONG	visitor impacts could be of concern.
				FOPU	stream here is oyster creek, which isn't freshwater.
				CHAT	tied to both the enabling legislation and GMP.
				CONG	water resource management plan calls for maintaining biological integrity of WR.
				FOPU	at least 3.
	Estuaries		Are physical and chemical features of the intertidal environment changing?	FOSU	2 right now. Could go up.
				CAHA	it's all nursery habitat, but nobody knows what for.
			Are the distribution and use of fish spawning & nursery habitats changing over time?	CALO	SAV. Same reasons as for sea grass question.
				CANA	drives closing actions / protection strategies. Important for outstanding fishery.
				FOPU	don't think this is an issue right now.

Category			Question	Park	Notes
Park Resources	Habitats & Systems	Estuaries	Are the distribution and use of fish spawning & nursery habitats changing over time?	FOSU	don't know if we have either spawning or nursery habitats (probably not, though).
				CUIS	don't own those areas.
		Terrestrial System	Are coastal dune habitats suitable to support dependent animal communities?	CUIS	also stability of the dunes
				CAHA	this is in the enabling legislation for areas without recreation values. "wilderness"
				TIMU	all dune questions will change priorities when TIMU acquires American Beach.
				CALO	no T&E species of concern.
			Is forest structure changing over time?	FOPU	no historic forest.
				FOSU	not a heck of a lot of forest.
				HOBE	needs to be known for FMP. Vertical structure necessary for burn planning.
				KEMO	impact of beetles
				OCMU	related to the wetland issues and effects on historically dry-land species.
				CALO	related to horse grazing
				FOFR	rescore if necessary for the FMP
		Marine Systems	Is distribution, relative abundance, or species composition changing in subtidal habitats?	FOSU	we have the submerged area.
				CASA	do have a good least tern nesting area. Good habitat for them.
				CUIS	critical nursery / foraging habitat.
			Is the distribution, relative abundance, or species composition changing in intertidal habitats?	CAHA	Off-road vehicle use and bird foraging
				CANA	Concerned about the oyster reefs. Boat wakes, disease, predators, and competition from barnacles all issues.
				CALO	foraging area for shorebirds; affected by ORV use.
		General	Are land use or land cover types within Park boundaries changing over time?	HOBE	FMP and GMP driven.
				KEMO	important because of changes to earthworks. If we have changes in forest type, accompanied by uprooting, etc. can do some potential damage. Currently no changes, though.

Category			Question	Park	Notes
Park Resources	Habitats & Systems	General	Are land use or land cover types within Park boundaries changing over time?	CAHA	maybe 3.5
				OCMU	land cover changes have been significant since 1994; changes in future might also be helpful to monitor.
Agents of Change	Park Resource Management	Maintenance / Trail Management	Are "down and dead" clearing activities affecting populations of animals that depend on forest litter for habitat, and are they best designed to mimic natural population and distribution dynamics?	MOCR	not doing this. Burning them.
				FOFR	some done for fire prep.
				FOSU	actions primarily limited to removal of trees in cultural / maintained landscapes.
				FOSU	don't really have sensitive plants at CHPI (probably), and we only do minimal trail clearing.
				CALO	building a boardwalk
		Exotic Plant Management	Are park management actions affecting sensitive plant communities (trail clearing, vegetation trimming, boardwalk construction)?	FOFR	not doing much of this
				KEMO	not that we know of.
				CHAT	in some cases positively affecting them.
				CHAT	recent EA said no; if that changes, we need to reassess.
				FOPU	not doing that
			To what extent are management activities effective in eliminating or slowing the invasion of exotic species?	OCMU	large amounts of wood is removed as part of the FMP; as it's the primary method of fuel reduction.
				FOSU	maybe a 3, but we're not doing a lot of this.
				CALO	park currently sprays for Phragmites, but other than that exotic plants are not a big issue for the park.
				OCMU	given impact to CR and amount of effort spent on this particular issue.
				FOSU	don't have a lot of exotics in the park, though. Low 3 at best.

Category			Question	Park	Notes
Agents of Change	Park Resource Management	Exotic Plant Management	What are the effects of exotic plant species on Park resources?	CHAT	We know that exotic plants are affecting native plant populations (competition / displacement).
				CANA	not limited to cultural resources
				FOSU	Wisteria was growing on the cultural landscape.
				HOBE	Some populations taking over areas at the expense of native species.
				KEMO	right now not significant, but if unchecked, it could be.
		Cultural Resource Management		TIMU	plants growing on structures all over the place. Some ruins are overrun with plants.
				MOCR	used as erosion control on battle lines. Mold, mildew, fungus... also of concern.
				HOBE	Privet expanding into cultural areas / landscape.
				FOSU	biggest issue is grass growing between the bricks. When removed it does damage to the historic structure.
				CANA	There is some plant damage to our archeological sites (roots growing into the mounds, etc.)but it is not a major problem and can be easily monitored. They actually provide more benefit by curbing erosion.
				CHAT	some NHR sites that have plants-on-structure issues. Info could help guide management decisions / planning.
				FOPU	ferns growing in mortar and brick. Removed. Don't know of the effects of removal practices on mortar and brick.
	Fire Management	Does mechanical fuel reduction appropriately mimic natural ecosystem processes?	KEMO	where this is done, it's the only management option.	
			CHAT	very important issue because mechanical fuel reduction is happening for safety reasons.	
			CASA	no mechanical fuel reduction program	
			HOBE	FMP driven.	
			CALO	no fire mgmt program	
		To what extent are tree densities, understory composition, and fuel loads changing over time in areas of (historically) natural fire? i.e., what is the level of fuel loading...	FOSU	not called for in the FMP. Might need to be elevated to a 2 if it is an area of natural fire.	
			KEMO	FMP. Park hasn't had natural fire in roughly 30 years. There have been some human activity related fires. Also some set by cigarettes and railroads. Fuel loads are increasing with pine beetle damage.	

Category		Question	Park	Notes
Agents of Change	Park Resource Management	Fire Management	OCMU	might go lower after current round of reduction is complete and fuels are removed.
			CASA	no prescribed burning program
			CHAT	will get worse with time due to history of fire suppression. Might become a 4 with more information.
		Restoration	CAHA	could be an issue with Cape Point, and wit potential mitigation work around Oregon Inlet.
			CHAT	tied to Johnson Ferry wetlands \restoration project.
			CONG	historic hunt-club ditches that are affecting flows that someday might be restored.
			MOCR	wetland restoration taking place in the Savannah.
			CUIS	will be doing this in the future in the historic rice fields and causeways.
			CANA	need to know to evaluate wetland restoration efforts
			KEMO	have planted some pine trees on the eastern boundary near Bernhickey Road. Have done some plantings on the south portion of Little Kennesaw Mountain for erosion control purposes.
			MOCR	planting longleaf
	External Stressors (Anthropogenic)	Land Use & Development	CHAT	very high priority because it will have direct affects on water resources. Will likely cause other priorities to change.
			CUIS	flow restrictions on causeways
			KEMO	roads probably don't impact water resources within the park.
			FOSU	no new roads planned for the area.
			FOPU	turtles and widening of HWY 80.
			OCMU	16 has messed up a lot. Railroad too.

Category			Question	Park	Notes
Agents of Change	External Stressors (Anthropogenic)	Land Use & Development	Is local air quality near road corridors, campgrounds or areas of high visitor use changing?	CALO	vehicles on beach
				CHAT	local air quality not as big of an issue as regional air quality.
				FOFR	no campgrounds
				KEMO	metro area AQ is likely much bigger impact.
			To what extent is adjacent land use affecting sensitive species within the park?	FOFR	probably not at all.
				FOSU	we don't know if we have any sensitive species.
				CHAT	almost all of park is directly affected by adjacent land use.
				CALO	Park sits on science advisory panel for the Albemarle Pamlico Sound. No big effects expected, though.
			To what extent is air chemistry affecting water resources, and how is that changing over time?	HOBE	could easily be talked up to a three if there were an identified sensitive species that might or might not be affected by adjacent land use.
				KEMO	we don't know the answer right now.
			What are the effects of human-induced disturbances on freshwater resources?	CALO	Park sits on science advisory panel for the Albemarle Pamlico Sound.
				MOCR	hog lagoon overflows
				HOBE	property to the north has a water withdrawal structure on a freshwater spring (culvert type of thing). Cistern type of thing.
				CHAT	nice vague question... lots of impacts, though.
			What are the status and trends in contaminant emissions (air quality)?	CONG	local paper mills.
				FOPU	paper mills, shipping.
				CHAT	only ozone is known to be a problem.
				HOBE	Aniston Army Depot (fort McClellan) has an incineration facility that started up in March 2004 that is disposing of weapons-grade materials (i.e., nerve & biological agents). Located 45 miles away from the park.
				FOSU	from things like paper mills and shipping.

Category			Question	Park	Notes
Agents of Change	External Stressors (Anthropogenic)	Land Use & Development	What are the status and trends in upslope conditions that affect hydrology and delivery of sediments, large woody debris, and contaminants to streams and estuaries?	FOSU	Combination of concerns with golf course and potential impacts if Boone Hall is developed.
				OCMU	post-rain peaking due to higher levels of impervious surface. Lots of urban development. Walnut creek on 303d list.
				CHAT	3+
			What are the status and trends of culverts and other flow restrictions within and surrounding the park?	CUIS	could be a 0
				CASA	none impacting park resources.
				OCMU	lots of trash entering as a result (from entire northern urban area). Trash removal / remediation.
				CUIS	causeways
				CONG	development pressure is coming; could be bumped up in the future.
				FOPU	widening of HWY 80
				FOSU	not likely to change at this point.
				KEMO	pressure to widen and increase roads to support growing traffic needs.
				OCMU	Fall line freeway is big issue facing the park.
				CANA	will help with evaluating wetland / impoundment reconnection efforts
				FOSU	If Boone Hall next to CHPI (roughly 800 acres), this could affect resources at CHPI.
			What is the degree of habitat fragmentation within the landscape (of which the park is a part)? And how is it changing over time?	FOFR	possibly affecting deer and wood storks.
			What is the direction and rate of change of land use within the watershed?	FOSU	Boone Hall.
				MOCR	hog farm upstream has had a spill.
				CUIS	"watershed" not necessarily important for this system.

Category			Question	Park	Notes
Agents of Change	External Stressors (Anthropogenic)	Land Use & Development	What is the pattern of land use types within the landscape that might have an impact on Park resources?	CUIS	marinas
				MOCR	because of sound and visual aspects.
				HOBE	external land use is changing, and could have large effects on water quality over time if/when changes occur (i.e., increases in high density chicken farming can affect water quality.)
				FOSU	primarily urban in all directions.
				CAHA	3.5
			What is the rate of change in adjacent land use?	FOFR	changing to residential and golf.
				FOSU	could become a bigger issue if Boone Hall is ever developed.
				MOCR	related to land protection plans.
				OCMU	Macon is growing.
				CUIS	rate is FAST
		Adjacent NR management	Are Park populations of deer, turkeys, hogs, waterfowl, and feral dogs changing in response to changes in hunting regulations outside the park?	HOBE	changes in hunting regulations (upcoming) will likely reduce feral dogs and consequently increase deer populations. Could be upgraded to three depending on observed changes.
			To what extent are external hunting pressures affecting animal populations within Park boundaries?	KEMO	only hunting allowed in Cobb County is bow hunting. Impact is likely too low to be an issue for KEMO.
				FOFR	we have had a shot deer at FOFR. Other than that no game species present.
				CALO	ducks only species of concern at this point.
				CHAT	might be some adjacent hunting near the northern units, but the affects (if any) on park resources are unknown. Might need to change to a 2, but as the area urbanizes, this problem will disappear.
				CANA	probably not an issue at CANA
				FOPU	no adjacent hunting. Except for marsh hens around our boundary.
			To what extent are off-shore and adjacent fishing pressures affecting Park populations?	CANA	particularly large problem with sea turtles

Category			Question	Park	Notes
Agents of Change	External Stressors (Anthropogenic)	Adjacent NR management	To what extent are off-shore and adjacent fishing pressures affecting Park populations?	FOPU	adjacent shellfishing, crabbing. Do have some crabbing (commercial) on adjacent lands that does spill over inside park boundaries.
				FOSU	likely minimal because park habitat is so small.
				CUIS	there are turtle effects.
			What are the incidence rate, virulence, and impacts of wildlife diseases on animal populations? (on adjacent lands)?	FOSU	not a high 2.
				CHAT	rabies???
				FOPU	could be some impacts with avian virus. Maybe sea turtles, too.
				HOBE	bee fungus, rabies is rampant in raccoon and skunk populations. Due to potential public health issues, this might become a four. Monitoring will be done by the State if bumped up.
				CAHA	equine encephalitis, wnv
			What are the incidence rates of wildlife disease to which humans are at risk?	FOSU	WNV has been reported in Charleston.
				CALO	WNV and Limes disease; none reported yet, though
				CHAT	rabies???
				FOPU	rabies in raccoons. Hantavirus also has been identified. WNV, Lyme.
				HOBE	see rabies note above.
				KEMO	Lyme, WNV. No indication that this has been an issue. Ticks and mosquitoes are there, though.
				CAHA	wnv
				FOFR	lyme disease, WNV. None yet found at FOFR, but have been found w/in animals in County
		Other	To what extent are jetties affecting sediment transport budgets?	CAHA	Oregon Inlet
				FOSU	we know the jetties are leading to accretion.
				CUIS	because of Florida
				CANA	Ponce Inlet to the North of CANA may be affecting sand transport

Category			Question	Park	Notes
Agents of Change	External Stressors (Anthropogenic)	Other	To what extent are large impoundments and water diversion structures affecting water resources within Park boundaries?	CAHA	cape point
				FOPU	we have a dyke inside the park that controls the water levels within the park. (Water control structure for the moat)
				HOBE	Large dam upstream. Affects hydroperiod and potentially water quality.
				OCMU	could be of greater importance as Atlanta grows.
				CANA	need to know for impoundment reconnection and wetlands restoration occurring within the park
			To what extent are shoreline erosion control structures (revetments) affecting erosion rates?	FOSU	beach by Fort Moultrie has revetments as does Fort Sumter. Combination of all structures is likely affecting erosion rates at the Fort.
				FOPU	if we find out it's not an issue we can downgrade priority.
				CHAT	some rip-rapped areas.
				MOCR	because of cultural resources.
				CONG	bridges, Cedar Creek Canoe access has some revetment work that might have erosion issue.
				CANA	Revetment immediately north of park may be causing erosion
			To what extent do docks, piers, bulkheads and other shoreline stabilization structures affect natural hydrology and adjacent communities?	CAHA	at FORA
				FOSU	we have nearby docks and riprap around the fort. Don't know if they're affecting hydrology, though. Perhaps sediment transport, though.
				CALO	b/c of new renourishment project.
				FOPU	dredging / channel deepening proposal in process.
				CHAT	many docks that are out of compliance. Impacts need to be quantified.
				CASA	implications for the Fort (structure) at FOMA.
			To what extent do mosquito control structures and other flow restrictions affect water resources?	FOPU	Ditches on park.
				CONG	need to check with what we said at CHAT.
				HOBE	none exist at this time.

Category			Question	Park	Notes
Agents of Change	External Stressors (Anthropogenic)	Other	To what extent do mosquito control structures and other flow restrictions affect water resources?	CAHA	cape point
				CANA	many current and historic mosquito control activities occurring within park
Agents of Change	External Stressors (Anthropogenic)	Other	To what extent do regional / adjacent stormwater management activities affect Park resources?	OCMU	All the garbage and highly polluted water into the park. High fecal coliform readings after big rain events. Several sewage spills within the park.
				FOPU	stormwater runoff from Wilmington Island.
				CASA	has implications for water quality in the salt marsh
				HOBE	as development happens, treatment facilities might increase.
				KEMO	might be some areas on the eastern boundaries of the park.
				MOCR	Corps lock & Dam upstream manages for flood control. Don't know whether effects are CORPS driven or rain driven. Potentially downgrade to a 2.
				HOBE	have a decent beaver issue.
				KEMO	perhaps a 4. No resources at risk. Might have an impact on trail system.
			What are the effects of beavers on natural hydrology?	CONG	don't know what the status of beaver in the park is at this point. Not a nuisance at this point.
				CHAT	we do receive complaints about them from adjacent neighbors. County receives complaints.
				MOCR	Because of potential impacts on CR, this might need to be elevated to a 4. Beavers are newly active in the last 6-7 years. County has a beaver management specialist. Beavers are also affecting riparian trees. Elevated to 4 on 7/12 due to renewed impac
				TIMU	might have beavers on the north side, but not in the park at this point. Maybe a 2?
				CUIS	none present
			Are chemical, physical, or biological processes in wetlands changing over time?	OCMU	large amount of wetlands on site.
				MOCR	w / restoration, this becomes of hither interest.
				CUIS	don't know if this is an issue.
				CONG	could go up to a four based on results of current research.
				FOPU	Mercury issue. We have a lot of recreational shellfish harvesting.
			What are the extent and impacts of bioaccumulation and biomagnification on park resources and visitor experience?		

Category			Question	Park	Notes
Agents of Change	Ecosystem Function	Energy / Material Flow	What are the extent and impacts of bioaccumulation and biomagnification on park resources and visitor experience?	OCMU	junkyard effects.
				CAHA	2.5
				HOBE	tied to fire management program. Could be higher.
		Disturbance / Recovery	Are species associated with early successional stages of major (natural) disturbances adequately represented within the park?	FOPU	primarily early succession on dredge spoil islands (no more than 100 years old)
				CHAT	management actively selects against early successional species. Don't know what species would realistically be expected to exist within the 2000 ft. corridor.
				CHAT	this is the tristate issue.
			To what extent are flow dynamics and hydroperiod of aquatic systems changing over time (including rivers, lakes and ponds, wetlands, and estuaries, ditches)?	KEMO	no impacts at KEMO
				MOCR	erosion during swift water.
				FOFR	don't know if there are changes
			To what extent are the magnitude, frequency, and extent of flooding events changing over time?	CHAT	full-on natural flooding not going to happen due to urban interface. Ecological significance of those that do happen is more of a research question. Shift in all is happening right now.
				KEMO	no impacts at KEMO
				CALO	related to hurricanes
				HOBE	affected by the dam upstream.
				OCMU	either drought or frequent 100 year floods...
				CALO	related to hurricanes
				CASA	FOMA structure highly susceptible to structural damage resulting from changes in sea level.
				FOPU	perhaps a 3?

Category			Question	Park	Notes
Agents of Change	Ecosystem Function	Trophic Structures	What are the status and trends of natural predators?	CHAT	receive complaints about coyotes. Fairly isolated reports, though. Don't know enough about number or distribution at this point to know how important this issue is at this point.
				OCMU	only mammal predator we have is coyote.
				MOCR	coyotes are on the rise in the county. Mammal inventory didn't find any inside the park, but tracks outside. Fox populations fairly stable.
				KEMO	coyotes have likely increased of late. Would likely be more useful to park neighbors than to us.
				FOFR	raccoons only
				CASA	they're stable. Reports of bobcat family in the area.
				CANA	bobcats, raccoons, grey foxes, ghost crabs. Effects on marine turtles.
				CALO	existing PMIS statement concerning raccoons trying to determine management thresholds for removal
				HOBE	bobcats are here, but we don't know how big the populations is
				CAHA	red foxes
	Other Issues	Animal Behavior	What are the status and trends of large carnivores (bobcat or bigger)?	CHAT	large cats and bears have been spotted. Coyotes, too!
				OCMU	bears might be soon encroaching
				FOFR	none present
				FOPU	coyotes, foxes. No more than 3.
				FOSU	we have a fox. With pups.
				HOBE	bobcats present
				MOCR	bobcat family nearby
				CUIS	bobcats are predators on oystercatcher eggs
				KEMO	Did have a mountainlion report that was probably a bobcat.
				HOBE	could be bumped up if we find out thagt the bee fungus is affecting pollinator communities.
		Visitor Use	Are human uses within the park (Non NR management) affecting surficial hydrology?	FOPU	probably just seasonal changes.
				FOFR	not an issue

Category			Question	Park	Notes
Agents of Change	Other Issues	Visitor Use	Are the number and activities of concessionaires, Incidental Business Permit (IBP) users, and special use permits changing?	FOSU	special use permits have been increasing.
				CANA	Use increasing significantly in Mosquito Lagoon. Will become a big issue.
				CUIS	more kayaks (IBPs)
			Are visitor uses impacting native vegetation?	CALO	probably not as much as horses are.
				CANA	dune impacts and sea grass impacts primary concern
				FOFR	in Bloody Marsh?
				FOPU	fishermen trampling spartina, but it comes back every year so it's probably not a big problem.
				CUIS	not a problem at this point
				CAHA	dunes
			Are visitors' desires for, expectations of, and actual experiences in the park changing?	KEMO	social trail problem exists at the park, particularly with adjacent land users.
				CALO	Yes, b/c of more visitation.
				CASA	this could change dramatically as the resources change in response to higher visitation rates.
			How are the number, distribution, and size of human-impacted sites changing over time? (incl. trails, campsites, boat launches...)	KEMO	expectations probably will change due to increase due to more visitors.
				CASA	boating access and social trail creation, particularly in due system.
				CHAT	social trails and encroachments make this a large evolving issue.
				FOFR	not changing
				FOSU	could become of higher interest as visitation increases. Primary concern is litter.
				HOBE	no campsites, boat launches... no noticeable significant impacts from overuse of trails or other high use areas. Could change if visitation increases.
				KEMO	social trail creation
				CUIS	increased boating activity is happening and is expected to continue.

Category			Question	Park	Notes
Agents of Change	Other Issues	Visitor Use	How are the type, amount, and distribution of visitor uses changing over time?	KEMO	more of 'em. If there is a change, it's an increase in usage of the trail system.
				CANA	boaters of concern, in particular
				FOPU	are seeing an increase in jetskis and kayaks.
				HOBE	this will change as the area around develops and trail use increases. Horse use is starting to increase.
			To what extent are boating activities affecting submerged aquatic vegetation beds & associated communities?	FOSU	visitation has been increasing.
				FOSU	unless we find out that we have seagrass beds somewhere where we have jurisdiction.
				CALO	also commercial boating activities.
				CANA	big impact to oyster beds and seagrass beds
			To what extent are off-road vehicles impacting natural resources?	KEMO	no significant damage being done. b/c not allowed.
				CALO	ORV EA in process.
				CASA	this is an known problem and is not allowed.
				CHAT	an issue within the easements in the northern park units. Need management actions more than anything.
			To what extent are patterns of water-runoff, sedimentation, and erosion changing or increasing in areas of high recreation use?	FOPU	we occasionally have this issue. No trail.
				HOBE	occasionally happens, but infrequently (two within the last year, and primarily kept to roadways). Park could become more vulnerable to ORV use after clearing actions related to the FMP. Might need to be later reevaluated.
				CUIS	includes both residents and NPS
				MOCR	with canoe access this could become an issue in the future.
				KEMO	trail on little Kennesaw is a problem.
				FOSU	no high recreation use areas.
				CONG	may become an issue in the new area.
				CHAT	high visitor use having known impacts.
				CUIS	not a problem at this point

Category			Question	Park	Notes
Agents of Change	Other Issues	Visitor Use	To what extent are personal watercrafts, canoes, or other boats impacting natural resources?	CHAT	some areas don't allow motorized vehicles. Lots of questions...
				MOCR	canoe and kayak use on the rise.
				CANA	big impact to oyster beds and seagrass beds
				CUIS	will be increasing with addition of marina.
				FOPU	starting to get a little more of this. JetSkis are not permitted within the park.
			To what extent do human uses of natural areas affect behavior, distribution, and abundance of natural animal populations?	FOSU	minimal, but people bring their own vehicles to sandy shoal at Fort Sumter.
				CALO	ORV effects.
				CANA	shorebird interactions. Rookeries in jointly managed areas have had problems with people scaring off birds
				CHAT	could be important for trails management, especially since CHAT's humans come with dogs.
				FOFR	not a known issue
			To what extent do human-animal interactions affect behavior, distribution, and abundance of natural animal populations?	FOSU	we don't have a whole lot (if any) human-animal interactions.
				FOFR	not happening
				CHAT	goose feeding.
				CASA	Of concern with birds on the beach
				FOPU	alligators in the moat.
			To what extent is horseback riding on trails affecting natural resources	CALO	raccoon feeding a problem
				CANA	raccoon feeding a problem. Manatees threatened by speeding boats.
				KEMO	is allowed, but limited to certain areas of the trail system. Potential issues at stream crossings.
				HOBE	horseback riding is soon to be officially permitted on service roads and restricted to certain trails.
				CASA	some occasional riding on the beaches but not often.
				CANA	limited only to beaches right now. Might expand to Bill's Hill in the future in which case we might want to elevate to a 3.

Category			Question	Park	Notes
Agents of Change	Other Issues	Visitor Use	To what extent is use of backcountry / Wilderness areas affecting Park resources?	OCMU	Lamar unit might be considered backcountry
				HOBE	no designated wilderness. Backcountry areas are not very well utilized.
				CANA	Minor impact
				CALO	Shackleford is a proposed wilderness area. Growing number of boats accessing island, though (as many as 400-500 on the 4th of July).
			What type and extent of natural resource degradation are occurring due to visitor uses?	MOCR	none designated at Park.
				FOFR	potentially cultural impacts only
				CALO	ORVs
				FOSU	don't really have any natural resource degradation; only cultural.
				KEMO	we know this is primarily on the trails, also impacts on earthworks.
				HOBE	there are some local ginseng harvesters in the area...
		Resource Extraction	Are commercially valuable plant species (i.e., ginseng, goldenseal, bloodroot) being impacted by illegal harvesting?	FOFR	don't think any are present
				CAHA	Dredging is all done outside of our boundaries. Dumping of sediments and noise are bigger issues.
			Are dredging operations changing hydrology?	CALO	going to be dredging this february. Beaufort Inlet is dredged.
				CASA	not noticing or concerned with hydrologic issues at this time.
				HOBE	don't know if this is even happening.
				OCMU	Ocmulgee is navigable to Macon, but USACE has not dredged for many many years. Not likely to happen any time soon for political reasons.
			Are levels of native vegetation harvesting changing?	CAHA	blueberries
				HOBE	some poaching going on, but not at a significant level (as far as we know)
				FOSU	not happening within the park
				CANA	sea oats harvesting?
				CONG	paw paw and muscadine

Category			Question	Park	Notes
Agents of Change	Other Issues	Resource Extraction	How do beach re-nourishment projects affect hydrography (i.e., residence time, wave climate, loss of shoals, overland flow, sediment budget)?	FOSU	not happening as much as historically.
			Is water quantity changing in response to (regional) water withdrawal and impoundment?	FOSU	In Charleston area, definitely an issue. Not an issue right now at the Park.
				FOPU	groundwater extraction effects.
				FOFR	mostly gw-fed system
				KEMO	all regional withdrawal is occurring downstream.
				CHAT	this really is the tristate issue.
			To what extent do finfishing and shellfishing affect native populations (within park boundaries)?	FOFR	fiddler crabbing at Bloody Marsh
				FOPU	crabbing.
				CANA	Increasing to alarming levels and may already be negative impact
				FOSU	FOSU is an active recreational fishing area. Don't know the impacts, but they're assumed to be low compared to overall Charleston Harbor.
				MOCR	after fish survey?...
				HOBE	lots of summertime fishing going on.
			To what extent does groundwater extraction affect water tables, uplands, estuaries, wetlands, and surface water availability?	CUIS	Maybe a 4?
				FOFR	mostly gw-fed system
			To what extent does hunting pressure within the park affect populations / communities (permitted and poaching)?	HOBE	Poaching does happen, but the extent of impacts is not known.
				FOPU	we do have some poaching, but not much.
				CANA	Good to know impact on duck populations since some are decreasing on a continental basis
				FOFR	not permitted / happening
				CHAT	poaching happens

Category			Question	Park	Notes
Agents of Change	Other Issues	Resource Extraction	To what extent does hunting pressure within the park affect populations / communities (permitted and poaching)?	CUIS	hunting is allowed; deer and hogs only
				CONG	dredging of Congaree River has been proposed for sight-seeing boat traffic.
				FOSU	potential effects on shoal generation at Fort Sumter.
			What are the effects of channel dredging on natural systems?	CASA	has ramifications for both water quality and sound quality.
				HOBE	don't think there is any dredging going on at this time.
				CASA	could be some shellfishing issues, but magnitude (if any) is unknown at this time.
			What are the effects of commercial and recreational shellfish harvesting on park aquatic habitats?	FOSU	not happening within the Park.
				FOPU	crabbing. Only approved area for recreational shellfish harvesting in Chatham County.
				CANA	All we know is that it's significant and increasing
			What are the effects of sand mining on natural systems?	CUIS	Sand mining happens on Raccoon Keys
				HOBE	don't know of any that might be going on.
				CHAT	maybe a four?
			What are the effects of surface water extraction on Park resources?	CAHA	not a current issue
				CHAT	tristate
				CAHA	0?
			What are the impacts of specimen collecting on sensitive plant populations (scientific collection and poaching)?	HOBE	not sure the extent to which this is a problem but at least one adjacent landowner is withdrawing surface water from local springs.
				MOCR	not aware of any issues.
				FOSU	potential is there, but not an issue right now.
				HOBE	some poaching going on, but not at a significant level (as far as we know)
				MOCR	poaching has happened

Category			Question	Park	Notes
Agents of Change	Other Issues	Resource Extraction	What is the frequency and intensity of sand dredging?	CAHA	Isabel Inlet
				CHAT	some sand dredging areas happening.
				FOSU	For Fort Moultrie area, this happens once ever 7-10 years. Dredging happens in the harbor all the time. Definitely affects resources at the park.

Figures

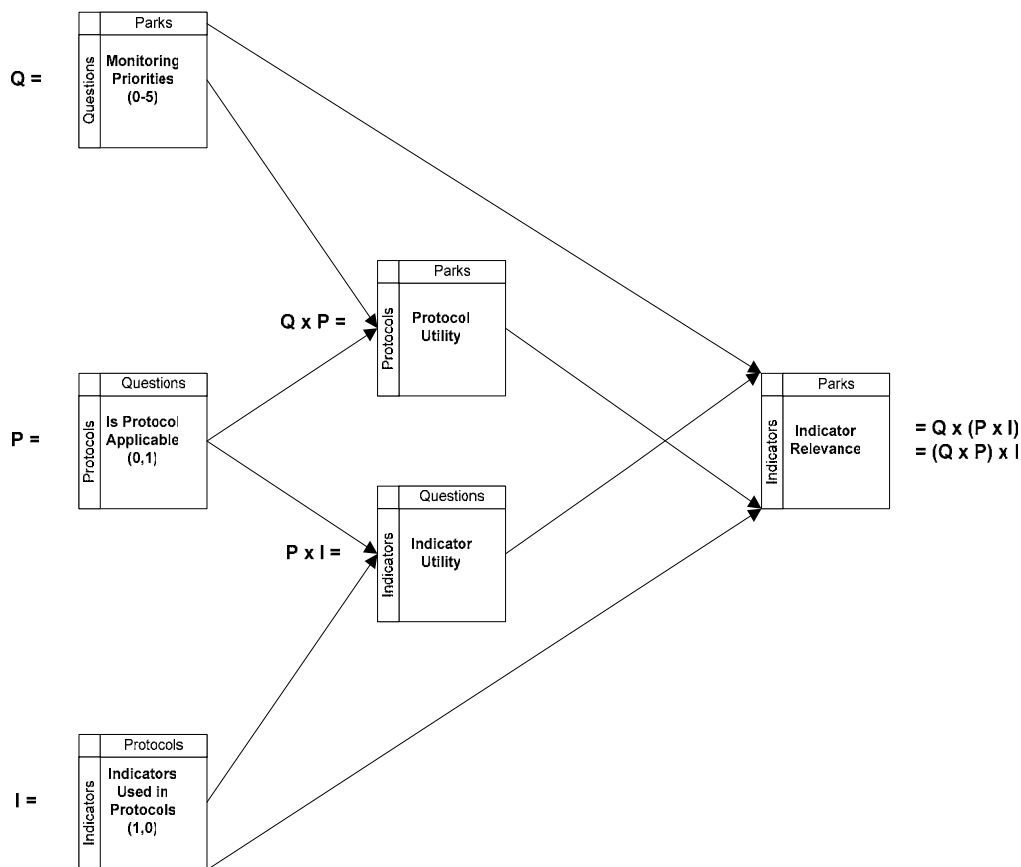


Figure A9-1. Data sets used for analysis of indicator relevance in the Southeast Coast Network.

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